BRIHANMUMBAI
MUNICIPAL
CORPORATION

ENVIRONMENT STATUS REPORT 2023 - 2024







Miyawaki Garden, Bhakti Park, Wadala

ENVIRONMENT STATUS REPORT
2023 - 2024

SCIENTIST IN-CHARGE
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महापालिका आयुक्त
बृहन्मुंबई महानगरपालिका

मनोगत

सन 2023-2024 या वर्षाचा बृहन्मुंबई 'पर्यावरण स्थितीदर्शक अहवाल' मुंबईकरांना सादर करताना मला अत्यंत आनंद होत आहे.

अद्ययावत सुधारित मुंबई महानगरपालिका अधिनियम, 1888 मधील कलम 61(अब) नुसार महानगरातील वने, पर्यावरणाचे संरक्षण व निसर्गाचे संवर्धन करणे हे बृहन्मुंबई महानगरपालिकेचे कर्तव्य आहे. महानगरपालिकेच्या पर्यावरण व वातावरणीय बदल विभागामार्फत बृहन्मुंबई 'पर्यावरण स्थितीदर्शक अहवाल' दरवर्षी तयार करण्यात येतो. सदर अहवालात बृहन्मुंबईतील पर्यावरणाचा मागील वर्षाचा (1 एप्रिल 2023 - 31 मार्च 2024) चिकित्सक दृष्टिने सविस्तर आढावा घेण्यात आलेला आहे. त्याबरोबरच भविष्यात महानगरातील पर्यावरण संवर्धनासाठी शासकीय, अशासकीय संस्थांचा व महानगरपालिकेच्या पर्यावरणस्नेही योजना व उपक्रमांचा देखिल यात परामर्श घेण्यात आलेला आहे.

मुंबई महानगराचा सर्वांगीण विकास करणे हे स्थानिक स्वराज्य संस्था या नात्याने बृहन्मुंबई महानगरपालिकेचे मुलभूत कर्तव्य आहे. हे कर्तव्य बजावत असताना शहरात निर्माण होणाऱ्या पर्यावरणीय समस्यांवर उपाययोजना करुन पर्यावरणाचे संरक्षण करणे देखील तितकेच महत्वाचे आहे. शहरातील बहुविध विकास कामे करताना अनेक नविन प्रकल्प उभारावे लागतात. तसेच नागरिकांना विविध पायाभूत सुविधा उपलब्ध करुन द्याव्या लागतात. हे सर्व करीत असताना याचा प्रत्यक्ष वा अप्रत्यक्षपणे पर्यावरणावर परिणाम होत असतो, ही सर्व स्थिती दर्शविण्यासाठी पर्यावरण सध्यस्थिती अहवाल तयार करणे व महानगरपालिकेस सादर करणे गरजेचे आहे.

बृहन्मुंबई महानगरपालिकेच्या विविध विभागांनी सन 2023-2024 मध्ये अनेक प्रकल्प हाती घेतले. त्यापैकी बरीच प्रकल्प कामे पूर्ण झालेली आहेत तर काही प्रगतीपथावर आहेत. यामध्ये घन कचरा व्यवस्थापन, उद्यान व प्राणीसंग्रहायल, पर्जन्य जलवाहीन्या, मलनि:सारण प्रकल्प, वर्षा जल व विनियोग, पाणी पुरवठा, रस्ते व वाहतूक, बेस्ट उपक्रम, शिक्षण, पर्यावरण, सार्वजनिक आरोग्य, आपत्कालीन व्यवस्थापन, मुंबई किनारी रस्ता प्रकल्प इत्यादी विभागांचा यात समावेश आहे. बृहन्मुंबई महानगरपालिकेचे हे प्रमुख विभाग पर्यावरण संरक्षणासाठी व संवर्धनासाठी कटिबद्ध आहेत.

पर्यावरण स्थितीदर्शक अहवालाच्या अनुषंगाने मला असे निदर्शनास आणून द्यावयाचे आहे की, बृहन्मुंबई महानगरपालिकेच्या घन कचरा व्यवस्थापन विभागामार्फत मागील पाच वर्षापासून राबविलेल्या विविध प्रकल्प व उपक्रमांमुळे सन 2023 मध्ये संकलित करण्यात आलेल्या कच-याचे सरासरी प्रमाण प्रतिदिन 6300 मेट्रिक टन इतके आहे. प्रतिदिन निर्माण होणा-या 6300 मेट्रिक टन घन कच-याचे निष्कासन, प्रतिदिन वाहनाच्या 921 फे-यांनी केले जाते. निर्माण होणा-या कच-याची वर्गवारी व प्रमाणानुसार

विभागणी करुन (ओला व सुका कचरा) तो स्वतंत्रपणे वाहून नेला जातो. तसेच घन कचरा व्यवस्थापन विभागाच्या पुढाकाराने नोव्हेंबर 2023 पासून सखोल स्वच्छता मोहीम अर्थात "डीप क्लिनिंग मोहीम" सुरु करण्यात आली. सदर मोहीमेच्या अंतर्गत एका विशिष्ट भागात सर्वकष स्वच्छता मोहीम राबविण्यावर भर देण्यात येत आहे. या मोहीमेस नागरिकांचा उत्स्फुर्त प्रतिसाद आणि सक्रिय सहभाग लाभल्यामुळे मोहीमेला व्यापक स्वरुप प्राप्त झाले आहे. मार्च 2024 या अखेरपर्यत 32,000 पेक्षा अधिक नागरिक, स्वयंसेवी संस्थांचे कार्यकर्ते, विद्यार्थी आणि महानगरपालिका कर्मचारी यांनी सखोल स्वच्छता मोहिमेत योगदान दिलेले आहे. त्यामुळे मुंबई महानगरातील पर्यावरणाचा समतोल राखण्यासाठी मुंबईकरांकडून हातभार लागतो आहे, याचा मला अभिमान आहे.

मुंबई महानगरातील अनेक समस्यांपैकी महत्त्वाची समस्या म्हणजे वाढत जाणारी वाहनांची संख्या आणि पर्यायाने वायू प्रदूषण व वाहतूकीची कोंडी होय. मुंबईतील वाहनांच्या संख्येत सन 2022-2023 च्या तुलनेत सन 2023-2024 मध्ये अंदाजे 4.91% इतकी वाढ झाली आहे. आजमितीस मुंबईतील विविध वाहनांची संख्या 47,59,976 एवढी प्रचंड आहे. वाहनांची ही वाढती संख्या महानगरातील वायू व ध्वनी प्रदूषण वाढण्यास कारणीभूत ठरत आहे. यावर उपाययोजना म्हणून मुंबईला स्वच्छ-सुंदर आणि प्रदूषणमुक्त करण्यासाठी बृहन्मुंबई महानगरपालिकेतर्फे सन 2021-2022 या वर्षापासून विद्युत उर्जेवर धावणारी वाहने (इलेक्ट्रिक व्हेइकल पॉलिसी) च्या परिणामकारक अंमलबजावणीला सुरुवात करण्यात आली आहे. सिनेमागृहे, पेट्रोल पंप आणि बृहन्मुंबई महानगरपालिका वाहनतळाजवळ विद्युत उर्जेवर वाहने भारीत करण्याची स्थानके (इलेक्ट्रिक चार्जिंग स्टेशन) प्रस्तावित आहेत. बृहन्मुंबई महानगरपालिकेच्या विद्युत वाहने विषयक धारेणाला मुंबईकरांचा प्रतिसाद मिळावा, अशी मला अपेक्षा आहे.

बृहन्मुबई विद्युत पुरवठा आणि परिवहन उपक्रम (बेस्ट) हा मुंबईतील वायू आणि ध्वनी प्रदूषणाची पातळी नियंत्रित ठेवण्यासाठी नेहमीच प्रयत्नशील राहिलेला आहे. पर्यावरण संवर्धनाचा एक भाग म्हणून बेस्ट उपक्रमातील सार्वजनिक वाहतुकीसाठी उपयोगात येणा-या एकूण 3160 बसेसपैकी 80% बसेस ह्या पर्यावरणपूरक कॉम्प्रेस्ड नॅचरल गॅस (सीएनजी) आणि विद्युत उर्जेवर चालणा-या बसेस आहेत. सन 2024 च्या अखेरीस बेस्ट उपक्रमाचा 50% पेक्षा जास्त ताफा विद्युत उर्जेवर धावणा-या बसेसचा असेल आणि सन 2026-27पर्यंत बेस्ट उपक्रमातील संपूर्ण बस ताफा 100% विद्युत बसगाड्यांचा करण्याचा बेस्ट उपक्रमाने धोरणात्मक निर्णय बेस्ट उपक्रमाने घेतलेला आहे. यामुळे वातावरणातील सुमारे 318296 टन एवढ्या कार्बनडाय ऑक्साईडचे उत्सर्जन कमी होण्यास मदत होईल. याबरोबरच बेस्ट उपक्रमाद्वारे विद्युत वाहनांना जास्तीत जास्त प्रोत्साहन मिळण्याकरीता मुंबईत बेस्ट उपक्रमाच्या वेगवेगळ्या बसआगार आणि बसस्थानाकांमध्ये विद्युत उर्जा वाहने भारीत करण्याची 50 स्थानके (इलेक्ट्रिक चार्जिंग स्टेशन) स्थापन करण्यात आलेले आहेत. तसेच 6 स्थानकांचे काम प्रगतिपथावर आहे. मुंबईतील प्रदूषण नियंत्रणासाठी बेस्ट उपक्रमाने उचललेले हे पाऊल अभिमानास्पद आहे.

देशाची आर्थिक राजधानी असलेल्या या महानगरातील जनतेला करमणूकीच्या सुविधा उपलब्ध करुन देणे, हे बृहन्मुंबई महानगरपालिकेचे कर्तव्य आहे. नागरिकांसाठी उद्याने परिरक्षित करणे, मनोरंजन मैदाने, क्रिडांगणे, उद्यानात शिल्पग्राम कला, वाहतूक नाक्यावर कारंजी, वाद्यवृंद पथकाद्वारे मनोरंजन, रोपवाटीका, रस्त्याच्या दुतर्फा व मध्यभागी हरीत पट्टा निर्मिती, मियावाकी उद्यानावर भर देणे इ. करमणुकीच्या सुविधा उपलब्ध करुन देण्यात आलेल्या आहेत. या व्यतिरिक्त क्रिडा, कला, सांस्कृतिक कार्यक्रम यांना प्रोत्साहन देण्यासह नागरिकांचे आरोग्य शिक्षण व आरोग्य संवर्धनाच्या दृष्टीने बृहन्मुंबई महानगरपालिकेने विशेष लक्ष केंद्रित केलेले आहे.

मला असे निदर्शनास आणून द्यायचे आहे की, पूर्वी रस्ते बांधणीसाठी पेव्हर ब्लॉक, अस्फाल्ट, मास्टिक अस्फाल्ट या सारख्या विविध सामुग्रीचा वापर केला जात होता. परंतू, मुंबईत कमी वेळेत जास्त प्रमाणात कोसळणारा पाऊस, विविध प्रकारच्या वाहनांची दैनंदिन वर्दळ, पर्यायाने वाहतुकीची जास्त घनता, विविध उपयोगिता सेवा पुरविण्यासाठी खोदलेल्या चरी अशा अनेक कारणांमूळे रस्त्यांची अवस्था बिकट होते. यावर मात करण्यासाठी महानगरपालिकेच्या रस्ते व वाहतूक विभागामार्फत मुंबईतील रस्ते खड्डेमुक्त करण्यासाठी सर्व रस्त्यांचे सिमेंट काँक्रिटीकरण करण्याचे धोरण आखले आहे. सिमेंट काँक्रिटीकरणामुळे रस्ते खड्डेमुक्त होऊन वाहतूक सुरळीत व सुरक्षित होण्याबरोबरच वेळेत व वाहनांच्या इंधनात बचत होण्यास देखील निश्चितच मदत होईल.

अलिकडच्या काही वर्षात मुंबईचा विकास अत्यंत झपाटयाने होत असल्याने पर्यायाने मुंबईच्या लोकसंख्येत देखिल प्रचंड वाढ होत आहे. अशा घनदाट वस्ती असलेल्या महानगरात आरोग्याच्या दृष्टीने मलनि:सारणाला अत्यंत महत्व आहे. घरोघरीच्या सांडपाण्याची विल्हेवाट व्यवस्था करण्याबरोबरच कारखाने, व्यापरी संकुले, उपहारगृहे, रुग्णालये आणि अन्य सार्वजनिक ठिकाणांचे सांडपाणी देखिल संकलित करुन विल्हेवाट करण्याच्या अखेरच्या टप्प्यापर्यत वाहून न्यावे लागते. सदर सेवेचे विस्तारीकरण करण्याच्या हेतूने बृहन्मुंबई महानगरपालिकेने मुंबई मलनि:सारण प्रकल्प टप्पा - 2अंतर्गत मलजल प्रक्रिया केंद्रांची व मलजल उदंचन केंद्राची बांधणी, पुर्नबांधणी आणि मलजल बोगदयांचे योग्य बांधकाम यासारख्या विविध प्रकल्पांची कामे हाती घेण्यात आलेली आहेत. अशा पर्यावरणस्नेही प्रकल्पांची कामे पूर्ण झाल्यावर पिण्यायोग्य पाण्याची बचत व संवर्धन, समुद्राच्या पाण्याच्या दर्जात सुधारणा, पर्यायाने समुद्र जिवसृष्टीच्या पोषक वातावरणात सुधारणा होऊन पर्यावरणाचे संवर्धन होण्यास ख-या अर्थाने मदत होईल, असे मला येथे नमूद करावेसे वाटते.

अद्ययावत सुधारित मुंबई महानगरपालिका अधिनियम 1888 चे कलम 61(क्यु) नुसार प्राथमिक शिक्षणाची सुविधा मुलांना उपलब्ध करुन देणे हे बृहन्मुंबई महानगरपालिकेचे बंधनकारक कर्तव्य आहे. ही जबाबदारी सन 1907 पासून महानगरपालिकेचे शिक्षण विभाग समर्थपणे पार पाडतो आहे. बृहन्मुंबई महानगरपालिकेच्या शाळांमधून विविध शैक्षणिक उपक्रमांतर्गत जसे की, वृक्षारोपण, इंधन बचत, घरगुती सेंद्रीय खतनिर्मिती मार्गदर्शन, प्लास्टिक वस्तूंचा वापर पूर्णपणे टाळणे, पाण्याचा योग्य वापर, शाळा परिसर स्वच्छता मोहिम, संगित आणि कला संस्कृती रुजविणे, श्रीगणेश मुर्ती मातीकाम कार्यशाळा उपक्रम, शिल्पकला स्पर्धा, उर्जा संवर्धन तसेच स्काऊट व गाईड इत्यादी उपक्रमांद्वारे विद्यार्थ्यांमध्ये पर्यावरण संवर्धनाबाबत जागृती निर्माण करणे, विद्यार्थ्याना आदर्श नागरिक घडविण्याचे मोठे कार्य शिक्षण विभागामार्फत करण्यात येते, याचा मला सार्थ अभिमान आहे.

बृहन्मुंबई महानगरपालिका सार्वजनिक आरोग्य क्षेत्रात अतिशय दर्जेदार सुविधा पुरवित आहे. कोणत्याही आपत्तीच्या वेळी महानगरपालिकेची रूग्णालये सदैव सज्ज असतात. शहरातील नागरिकांच्या आरोग्याची काळजी घेण्याचे काम मुख्यत: महानगरपालिकेचे असली तरी यामध्ये खाजगी वैद्यकिय संस्था आणि खाजगी वैद्यकिय व्यावसायिक यांचाही हातभार लागतो. महानगरपालिकेकडून विविध आरोग्य संसाधनांची व्यवस्था करुन मुंबईकरांच्या आरोग्याची काळजी घेण्यात येते. यामध्ये आरोग्य केंद्रे, दवाखाने, प्रसुतिगृहे, सर्वसाधारण रुग्णलये, विशिष्ट रुग्णालये व मुख्य रुग्णालयांचा समावेश आहे. महानगरपालिकेच्या सार्वजनिक आरोग्य विभागाद्वारे संसर्गजन्य रोग, कुष्ठरोग निर्मुलन, एडस नियंत्रण, लैंगिक व प्रजनन आरोग्य सुविधा, रक्त सुरक्षा कार्यक्रम तसेच अस्थमा समुपदेशन या सारख्या आरोग्य सुविधा उपलब्ध करुन दिल्या जातात. प्राथमिक आरोग्य सेवेपासून ते बहूउद्येशिय आरोग्य सेवेपर्यत

बृहन्मुंबई महानगरपालिका अविरतपणे प्रयत्न करीत आहे.

बृहन्मुंबईतील आपत्कालीन परिस्थिती प्रभावीपणे हाताळण्याकरिता महानगरपालिकेचा आपत्कालीन व्यवस्थापन कक्ष आधुनिक सेवा-सुविधांनी सुसज्ज करण्यात आला आहे. कोणत्याही आपत्ती दरम्यान आपत्कालीन व्यवस्थापन विभागामार्फत जलद व प्रभावी प्रतिसाद देणे, प्रतिसाद देण्याऱ्या सर्व यंत्रणामध्ये समन्वये राखणे, आपत्तीशी संबंधित माहिती नागरिकांना तात्काळ पुरविणे, सर्व स्तरांवर तयारी करीता प्रोत्साहन देणे, आपत्कालीन परिस्थितीत सर्व बाधितांना सहाय्य करणे, तसेच अपेक्षित व अनपेक्षित आणीबाणी संदर्भात नागरिकांना सतर्क करणे इत्यादी सेवा मुंबईकरांना तात्काळ उपलब्ध करुन देण्यात येतात. यावरुन आपत्कालीन परिस्थितीचा सामना करण्यासाठी महानगरपालिका समर्थ आहे, असेच म्हणावे लागेल.

सध्या वातावरणीय बदलामुळे अनेक समस्यांचा आपल्याला सामना करावा लागत आहे. ऋतूमानात होणा-या अचानक बदलामुळे पर्यावरणामध्ये असमतोल निर्माण होऊन अवकाळी पाऊस, चक्रीवादळ, भूकंपाचे हादरे, भूस्खलन, तापमानवाढ, अतिपर्जन्यवृष्टी इत्यादी नैसर्गिक आपत्तींना आपल्याला सामोरे जावे लागत आहे. हवामान बदलाच्या या पार्श्वभूमीवर ऊर्जा बचत करणे, सार्वजनिक वाहतुकीच्या साधनांचा वापर करणे, प्लास्टिक-थर्मोकोल वस्तुंचा वापर न करणे, पाण्याची बचत करणे, मोकळया जागेत कचरा न जाळणे, प्रदूषण मुक्त परिसर ठेवणे ऐवढे तरी आपण सहज करु शकतो. अशा साध्या आणि सहज करता येणा-या उपायांबद्दल मुंबईकरांमध्ये जागरुकता निर्माण होईल, याची मला खात्री आहे.

मुंबई महानगराच्या पर्यावरण संरक्षणात नागरिक आणि प्रशासन यांच्या सहयोगातून पर्यावरण संवर्धनाचे काम निश्चितपणे उभे राहिल आणि हे चैतन्यदायी महानगर स्वच्छ, हरित आणि प्रदूषणमुक्त राहील अशी मला आशा आहे.

धन्यवाद!

डॉ. भूषण गगराणी

महापालिका आयुक्त

बृहन्मुंबई महानगरपालिका

डॉ. अश्विनी जोशी
भा. प्र. से.

अतिरिक्त महानगरपालिका आयुक्त
बृहन्मुंबई महानगरपालिका (शहर)

मनोगत

अद्ययावत सुधारित मुंबई महानगरपालिका अधिनियम, 1888 मधील कलम 63ब च्या तरतूदीनुसार बृहन्मुंबई 'पर्यावरण स्थितीदर्शक अहवाल' तयार करुन दरवर्षी 31 जुलैपूर्वी महानगरपालिकेस सादर करणे अनिवार्य आहे. अद्ययावत सुधारित मुंबई महानगरपालिका अधिनियम, 1888 मधील कलम 6क(1) अन्वये महानगरपालिका आणि महानगरपालिकेच्या इतर प्राधिकरणांचे सर्व अधिकार सध्या प्रशासकांकडे निहीत असल्याने सन 2023-24 या वर्षाचा बृहन्मुंबई 'पर्यावरण स्थितीदर्शक अहवाल' माननीय महानगरपालिका आयुक्त यांच्यामार्फत मुंबईकरांसमोर सादर करताना मला अत्यंत आनंद होत आहे.

केंद्र शासनाने प्रदूषण नियंत्रणासाठी तसेच पर्यावरणाचे संरक्षण व संवर्धनासाठी विविध कायदे केलेले आहेत. यामध्ये जल (प्रदूषण प्रतिबंध व नियंत्रण) अधिनियम - 1974, वायू (प्रदूषण प्रतिबंध व नियंत्रण) अधिनियम - 1981, पर्यावरण (संरक्षण) अधिनियम – 1986 या अधिनियमांआ समावेश होतो आणि त्या अंतर्गत काही नियम तयार करण्यात आलेले आहेत. यामध्ये - हानीकारक टाकाऊ पदार्थ (व्यवस्थापन व हाताळणी) नियम – 2000, घन कचरा व्यवस्थापन अधिनियम – 2016, जैव-बैद्यकिय कचरा व्यवस्थापन व हाताळणी नियम - 2016, ई-कचरा (व्यवस्थापन) नियम – 2016, प्लास्टीक कचरा (व्यवस्थापन) नियम – 2016 इत्यादीचा समावेश आहे. सदर अधिनियमांची योग्य अंमलबजावणी करणे व मुंबई महानगरातील वायू प्रदूषण कमी करण्याच्या दृष्टीने राज्य शासनाच्या पर्यावरण व वातावरणीय बदल विभागाचे मार्गदर्शन व सहकार्याने तसेच महाराष्ट्र प्रदूषण नियंत्रण मंडळाच्या मदतीने बृहन्मुंबई महानगरपालिका सतत प्रयत्नशील आहे.

समुद्र किनारी वसलेल्या या महानगरास वातावरणीय बदलामुळे अवेळी पाऊस, अतिवृष्टी, अवर्षण, उष्णतेच्या लाटा, नागरी प्रदूषण अशा विविध समस्यांना तोंड दयावे लागत आहे. या पार्श्वभूमीवर वातावरणातील बदलांना सामोरे जाण्यासाठी बृहन्मुंबई महानगरपालिकेने 'सी - 40 सिटीज नेटवर्क' आणि 'वर्ल्ड रिर्सोसेस इन्स्टिटयुट ऑफ इंडिया' यांच्या सहकार्याने 'मुंबई वातावरण कृती आराखडा - 2022' तयार केला आहे. सदर आराखडयात सन 2050 पर्यत हरितगृह वायुंचे उत्सर्जन निव्वळ शुन्य (नेट-झिरो) पातळीपर्यत आणण्याचे उद्दिष्ट निर्धारित करण्यात आलेले आहे. या महत्वाकांक्षी आराखडयाच्या अनुषंगाने व आधारभूत मुल्यमापन कृती वाटचालीशी संबंधित उर्जा आणि इमारती, शाश्वत वाहतूक, शाश्वत कचरा व्यवस्थापन, नागरी हरितीकरण व जैव विविधता, हवेचा दर्जा तसेच नागरी भागांतील पूरस्थिती व जलस्त्रोत व्यवस्थापन ही सहा मुख्य क्षेत्रं निश्चित करण्यात आलेली आहेत. बृहन्मुंबई महानगरपालिकेने 'मुंबई वातावरण कृती आराखडयाची' यशस्वी अंमलबजावणी केल्यानंतर भविष्यात या क्षेत्रातील फायदे निश्चितच आपल्या दृष्टीपथास पडतील, याची मला खात्री आहे.

बृहन्मुंबई महानगरपालिकेमार्फत 'मुंबई वायु प्रदूषण नियंत्रण कृति अराखडा - 2019' च्या अनुषंगाने पूर्वीपासूनच महानगरातील वायू प्रदूषण रोखण्यासाठी विविध उपययोजना राबविण्यात येत असल्या तरी आपणांस अद्याप उदिष्टये अपेक्षेइतकी गाठता आलेली नाहीत. पायाभूत सुविधा प्रकल्प, उद्योगधंदे, वाहतूकची वर्दळ, अस्वच्छ इंधन वापर, अशा घटकांद्वारे होणा-या उर्त्सजनामुळे प्रदूषणात लक्षणिय वाढ झाल्याचे संदर्भित वर्षातील हिवाळा ऋतू प्रारंभापासूनच निर्दशनास आले आहे. अशा परिस्थितीत वाढत्या वायू प्रदूषणाची पातळी नियंत्रित करण्यासाठी व प्रदूषणकारी घटाकांना वेळीच अटकाव करण्यासाठी महानगरपालिकेने 'मुंबई वायु प्रदूषण शमन योजना - 2023' तयार करुन या योजनेच्या अनुषंगाने वायू प्रदूषणाचे स्त्रोत ओळखणे, स्त्रोत निहाय यादी तयार करणे, प्रकल्पांचे वर्गीकरण, अंमलबजावणी यंत्रणा व देखरेख यंत्रणा विकसित करणे, नियमांचे पालन न केल्यास दोषींवर कारवाई करणे, पुनरावलोकन यंत्रणा विकसित करणे व सुधारात्मक आढावा घेवून उद्दिष्टित लक्ष्य प्राप्त करणे इत्यादी बाबींची काटेकोरपणे अंमलबजावणी विभाग स्तरावर करण्यात येत आहे. वायू प्रदूषण शमन योजनेच्या अनुषंगाने महानगरपालिकेच्या हद्दीत असलेले विविध नियोजन प्राधिकरण व इतर शासकीय विभागांच्या सहकार्याने मुंबई महानगरातील वायू प्रदूषण नियंत्रणात आणण्यासाठी जाणिवपूर्वक प्रयत्न केले जात आहेत.

मला येथे असेही निदर्शनास आणून दयायचे आहे की, मुंबई महानगरातील इमारत बांधकाम, पाडकाम व तत्सम प्रकल्पांमुळेदेखील प्रदूषणात मोठया प्रमाणात वाढ होत आहे. या पार्श्वभूमीवर बृहन्मुंबई महानगरपालिकेमार्फत दिनांक 25 ऑक्टोबर, 2023 रोजी वायू प्रदूषण नियंत्रणासाठी मार्गदर्शक तत्वे जारी करण्यात आलेली आहेत. सर्व संबंधित यंत्रणांसाठी ही मार्गदर्शक तत्वे अनिवार्य असून त्यांचे अत्यंत काटेकोरपणे पालन करण्यात यावे, अन्यथा कठोर कारवाई करण्यात येईल, असे सक्त निर्देश महानगरपालिकेने दिलेले आहेत. महाराष्ट्र शासन, केंद्र शासन तसेच इतर संस्थानी प्रदूषणाशी निगडीत बाबींवर संयुक्तरित्या सहकार्य केल्यास मुंबई महानगरातील वायू प्रदूषणावर प्रभावी नियंत्रण आणण्यासाठी निश्चितच मदत होईल, अशी मला अपेक्षा आहे.

मुंबईतील पर्यावरण संरक्षण व संवर्धनासाठी बृहन्मुंबई महानगरपालिका कटिबद्ध आहे. हरित, सुंदर व स्वच्छ मुंबईचे स्वप्न साकार होण्यासाठी सुजाण मुंबईकरांचा सदैव सक्रिय सहभाग लाभेल, अशी मला खात्री आहे.

धन्यवाद!

डॉ. अश्विनी जोशी

अतिरिक्त महानगरपालिका आयुक्त
बृहन्मुंबई महानगरपालिका (शहर)

मिनेश दामोदर पिंपळे

महानगरपालिका उप आयुक्त
(पर्यावरण व वातावरणीय बदल)

आभार / अभिस्विकृती

'बृहन्मुंबई महानगरपालिका पर्यावरण स्थितीदर्शक अहवाल' तयार करण्यासाठी व विविध पर्यावरण पूरक उपक्रम राबविण्यासाठी वेळोवेळी केलेल्या मार्गदर्शनाबद्दल माननीय महानगरपालिका आयुक्त श्री. भूषण गगराणी, माननीय अतिरिक्त महानगरपालिका आयुक्त (शहर) डॉ. (श्रीमती) अश्विनी जोशी यांचे मी मनःपूर्वक आभार मानतो.

त्याचप्रमाणे महाराष्ट्र प्रदूषण नियंत्रण मंडळ, मुंबई विद्युत पुरवठा व परिवहन उपक्रम, महाराष्ट्र राज्य परिवहन महामंडळ, राष्ट्रीय केमिकल्स ॲण्ड फर्टिलाइजर्स लिमिटेड, भारत पेट्रोलिअम कार्पोरेशन लिमिटेड, मुंबई पोर्ट ट्रस्ट, अदानी इलेक्ट्रिसिटी मुंबई लिमिटेड, कांदळवन कक्ष आणि बृहन्मुंबई महानगरपालिकेचे विविध विभाग या सर्वांकडून माहिती उपलब्ध करुन देण्यात आली, त्याबद्दल त्यांचा मी मनस्वीः आभारी आहे.

मिनेश दामोदर पिंपळे

महानगरपालिका उप आयुक्त
(पर्यावरण व वातावरणीय बदल)

पर्यावरण स्थितीदर्शक अहवाल 2023-2024

मार्गदर्शक

श्री मिनेश पिंपळे
महानगरपालिका उप आयुक्त
(पर्यावरण व वातावरणीय बदल)

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पर्यावरण

संकलन व निर्मिती

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CONTENTS

आद्याक्षरे

ALM Advanced Locality Management
AMR Automatic Meter Reading
ATC Area Traffic Control
BEST Brihanmumbai Electric Supply & Transport
BMP Best Management Practices
BRIMSTOWAD Brihanmumbai Storm Water Drain
BOD Bio-Chemical Oxygen Demand
CBO Community Based Organization
CCRS Central Control Redressal System
CCTV Closed Circuit Television
CNG Compressed Natural Gas
CPCB Central Pollution Control Board
CRZ Coastal Regulatory Zone
CTRIC Civil Training Institute And Research Centre
dB Decibels (Unit of Sound Measurement)
DCR Development Control Regulations
DO Dissolved Oxygen
DPR Detailed Project Report
EIA Environment Impact Assessment
ETP Effluent Treatment Plant
FC Fecal Coliform
FFC Fact Finding Committee
FSI Floor Space Index
GVW Gross Vehicle Weight
IEC Information Education And Communication
lcpd Liters Per Capita Per Day
LPG Liquidified Petroleum Gas
MbPT Mumbai Port Trust
MCGM Municipal Corporation Of Greater Mumbai
MHADA Maharashtra Housing And Area Development Authority
MIDC Maharashtra Industrial Development Corporation
MLD Million Liters Per Day
MMC ACT Mumbai Municipal Corporation Act
MMR Mumbai Metropolitan Region
MMRDA Mumbai Metropolitan Regional Development Authority
MoEF Ministry of Environment And Forest
MOU Memorandum of Understanding
MPCB Maharashtra Pollution Control Board
MRTS Mass Rapid Transport System
MRVC Mumbai Railway Vikas Corporation
MSDP Mumbai Sewage Disposal Project
MSEDCL Maharashtra State Electricity Distribution Company Ltd
MSRDC Maharashtra State Road Development Corporation
MSW Municipal Solid Waste
MU Million Units
MUIP Mumbai Urban Infrastructure Project
MUTP Mumbai Urban Transport Project
NEERI National Environment Engineering Research Institute
NGO Non Governmental Organization
NSS National Social Service
NWDA National Water Development Agency
PAH Polynuclear Aromatic Hydrocarbon
PAP Project Affected People
PG Play Ground
PSI Pollution Standard Indx
PUC Pollution Under Control
RCF Rashtrya Chemicals & Fertilizers
RE Road Engineer
RG Recreation Ground
RMMS Road Maintenance Management System
RSPM Respirable Suspended Particulate Matter
RTO Regional Transport Office
SCADA Supervisory Control & Data Acquisition
SSP Slum Sanitation Programme
SPM Suspended Particulate Matter
SRA Slum Rehabilitation Authority
STP Sewage Treatment Plant
SW I Sewage Water Criteria I
SW II Sewage Water Criteria II
SWD Storm Water Drainage
TC Total Coliform
TDR Transfer of Development Rights
TSPTotal Suspended Particulates
VJBUVeermata Jijabai Bhosale Udyan
WSSDWater Supply & Sewage Disposal
WWTFWaste Water Treatment Facility

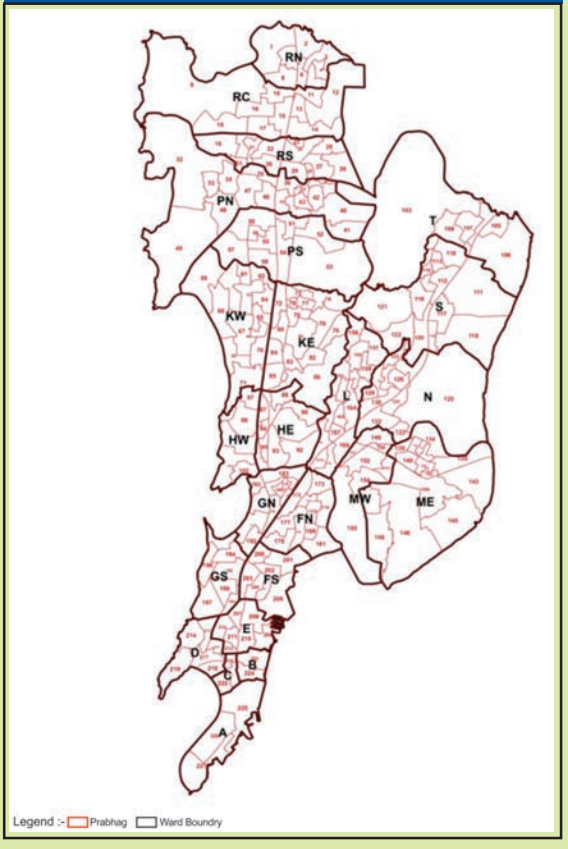
1. INTRODUCTION

The 74th amendment of the constitution of India in 1992 defines the role and duties of Municipalities & Municipal Corporations. The 12th schedule to the amended constitution states the scope of the work of the corporations. The scope includes environment protection, promotion of ecology and urban forestry. As a sequel to this, the Maharashtra state government issued an ordinance amend municipal act 1888, making “Environment Protection, Promotion of Ecology and Urban Forestry” as an obligatory duty vide section 61(ab) in the year 1994. The Environment Status Report (ESR) of the city of Mumbai for the period from April 2023 to March 2024 is prepared by Air Quality Monitoring and Research Laboratory of Environment section in Solid Waste Management department to fulfill the obligation under the clause ‘63B’ of Mumbai Municipal Corporation (MMC) Act 1888. This report is based on the factual and statical data generated using parameters affecting the environment by different departments of Brihanmumbai Municipal Corporation and various departments of state/ central government and industries.

2. DESCRIPTION OF THE AREA

Mumbai is located on the western sea coast of India from 18o 53' North to 19o 16' North Latitude and from 72o East to 72o 59' East Longitude. It was originally a cluster of seven islands. Later on these islands were joined to form present Mumbai. The total land of Greater Mumbai identified in Earlier Draft Development Plan 2034 (EDDP)was 458.28 sq km. The Municipal Corporation of Greater Mumbai (Brihanmumbai Municipal Corporation), however, was the Planning Authority of area that was more modest, since about 8.76% of the cited area fell under the jurisdiction of Special Planning Authorities (SPA).Currently Five such SPA exist in Greater Mumbai- MMRDA, SRA, MIDC,MbPT & Mhada. The Revised Draft Development Plan (RDDP) therefore prepared a development plan for 434.55 sq.km. leaving area with SA at 41.69 sq.km.The area of MbPT and Mhada SPA were inculded during the preparation of RDDP, as the said SPA's were declared on 23.04.2018 & 23.05.2018 by the GoM after the publication of RDDP.

Map 2.1: Mumbai Election Division Boundry - 2018



3. CLIMATE OF MUMBAI

The city of Mumbai has Tropical Savanna climate. Generally South-West monsoon arrives in the city in the month of June and retreats in the month of September. As per data recorded by Regional Meteorological Centre, in the year 2023, Mumbai received a total rainfall measuring 2481.3 mm at Colaba & 3018.1mm at Santacruz. The maximum rainfall of 1771.0 mm was recorded during July 2023 at Santacruz and it was 58.7% of total rainfall received. The maximum rainfall of 1330.4 mm was recorded during July 2023 at Colaba and it was 53.5% of total rainfall received.So it is observed that there was less rainfall as compared to previous year. (In the year 2022 total rainfall received 2875.8 mm at Santacruz and 2311.2mm at Colaba). In the month of May-2023 the maximum temperature of 33.70C, and in the month of January 2024 minimum temperature of 20.90C was recorded at Colaba. In the month of November 2023 the maximum temperature of 35.20C and in the month of January 2024 minimum temperature of 18.60C was recorded at Santacruz. At Colaba the maximum Wind Speed of 6.4 Km/hr and minimum 0.3 Km/hr was recorded. At Santacruz the maximum Wind Speed of 6.8 Km/hr and minimum 1.5 Km/hr was recorded. The Relative Humidity was recorded maximum 90% and minimum 62% at Colaba. The Relative Humidity was recorded maximum 90% and minimum 42% was recorded at Santacruz.

Monthly meteorological data like temperature, rainfall and wind speed for Mumbai is shown in Table No. 3.1

Table No. 3.1: METEOROLOGICAL DATA OF MUMBAI (2023-2024)

Month	Average Temp ^{0}C				Rainfall in mm		Relative Humidity in %				Wind Speed Km/Hr	
	Colaba		Santacruz		Colaba	Santacruz	Colaba		Santacruz		Colaba	Santacruz
	Max	Min	Max	Min			Time 0830	Time 1730	Time 0830	Time 1730		
April 2023	32.7	25.4	34.1	24.6	1.6	14.8	76	66	71	55	1.7	3.2
May 2023	33.7	27.0	33.8	27.1	17.2	3.4	75	66	71	63	2.4	3.6
June 2023	33.3	27.2	34.2	27.4	424.8	549.6	78	72	75	68	4.8	6.8
July 2023	29.2	24.9	29.3	25.1	1330.4	1771.0	90	88	90	86	6.4	4.9
August 2023	31.1	25.6	31.2	26.1	111.5	177.2	88	82	82	76	4.9	4.7
September 2023	30.7	25.0	31.2	25.2	528.8	483.4	90	84	88	82	1.8	2.9
October 2023	33.3	25.7	34.7	24.7	24.2	11.1	85	74	80	62	1.0	1.8
November 2023	33.6	24.4	35.2	22.6	42.8	7.6	82	67	72	54	0.9	1.5
December 2023	31.9	22.7	33.4	20.8	0.0	0.0	78	67	75	53	0.6	1.8
January 2024	30.6	20.9	31.8	18.6	0.0	1.0	75	66	77	48	0.4	2.1
February 2024	30.9	21.1	33.0	19.1	0.0	0.0	78	65	74	42	0.3	2.8
March 2024	31.3	22.6	33.3	21.5	3.2	0.0	79	62	72	49	0.9	3.1

Source: Regional Meteorological Centre, Colaba

4. MUMBAI POPULATION

Mumbai is one of the important cities of the world, is also recognized as the most densely populated city. Inverse proportion of area and population causes serious impact on its environment.

As per data received from Health Department of BrihanMumbai Municipal Corporation the estimated population of Mumbai is 13.06 million (year 2024). The population density of 27,029 person per sq.km (excluding no development area). Administrative Ward-wise population indicates that 'P/North' ward has maximum population of 9,88,154 persons where as 'B' ward has minimum population of 1,33,616 persons.

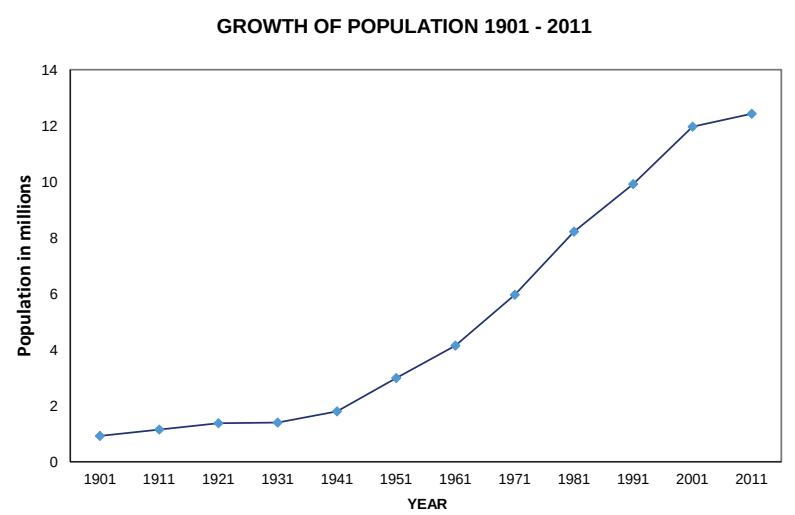
Table No.4.1 Growth of Population and rate of Increase during year 1901-2011

Table No.4.1: Growth of Population and rate of Increase during year 1901-2011

Year	Population in Million	% Growth
1901	0.93	-
1911	1.15	23.7
1921	1.38	20
1931	1.4	11.5
1941	1.8	28.6
1951	2.99	66.1
1961	4.15	38.8
1971	5.97	43.8
1981	8.22	38.0
1991	9.92	21.1
2001	11.97	20.6
2011	12.64	3.8

Source : Census Department of India

Graph. 4.1: Growth of Population



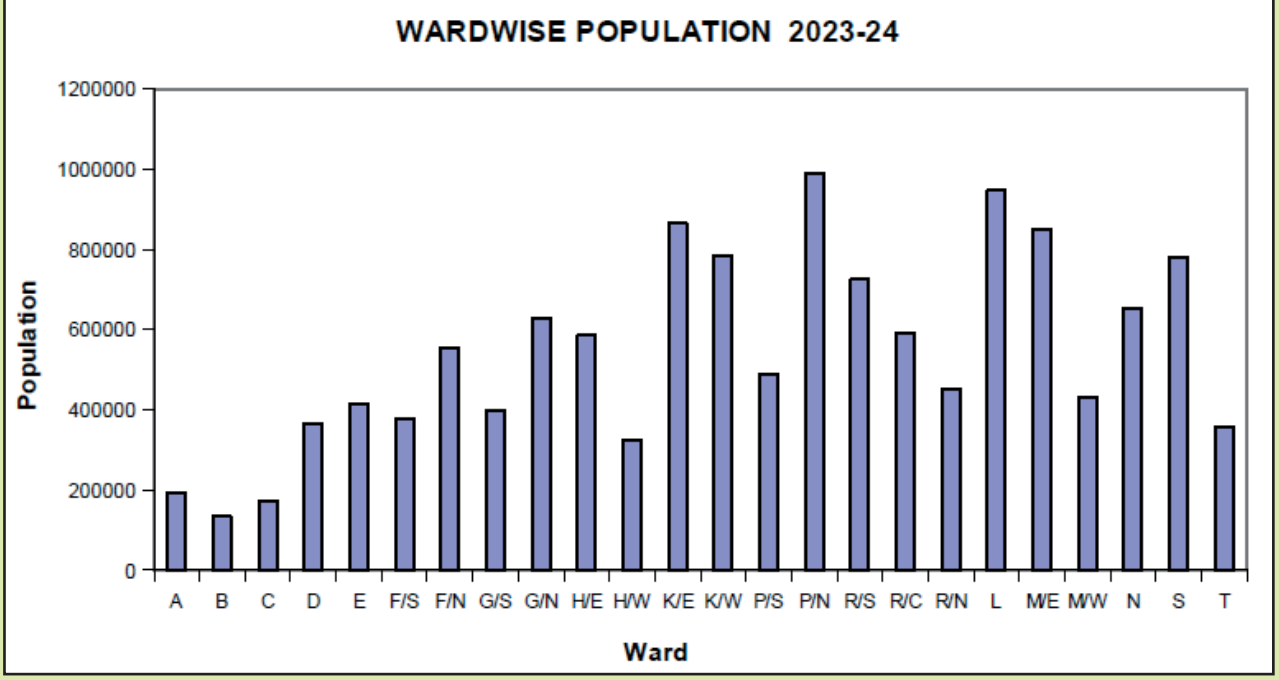
As per the mid-year election list of population in the year 2024, the wardwise area and population given by Public Health Department shown in table no. 4.2.

Table No 4.2: Wardwise Area & Population

Administrative Ward	Area in Sq.km	Population		Administrative Ward	Area in Sq.km	Population	
		2023	2024			2023	2024
A	11.20	193527	194210	P/S	25.19	484833	486544
B	2.65	133147	133616	P/N	46.70	984680	988154
C	1.91	173807	174419	R/S	18.31	723033	725585
D	8.30	362826	364106	R/C	47.95	588028	590102
E	7.27	411382	412833	R/N	14.17	451217	452808
F/S	9.87	377581	378913	**Western Ward**	**232.55**	**5781335**	**5801729**
F/N	12.85	553376	555328	L	15.62	943738	947067
G/S	9.74	395130	396524	M/E	38.19	844885	847865
G/N	8.31	626602	628812	M/W	17.62	430846	432365
City Ward	**72.1**	**3227378**	**3238160**	N	29.68	651512	653810
H/E	12.40	582879	584934	S	32.55	778006	780751
H/W	18.65	321734	322869	T	44.91	357174	358434
K/E	24.00	861794	864834	**Eastern Ward**	**178.57**	**4006161**	**4020292**
K/W	25.18	783137	785899	**BrihanMumbai Corporation**	**483.22**	**13014874**	**13060781**

Source: Development- Planning and Health Depts of BrihanMumbai Municipal Corporation

Graph 4.2.: WARDWISE POPULATION (Approx)



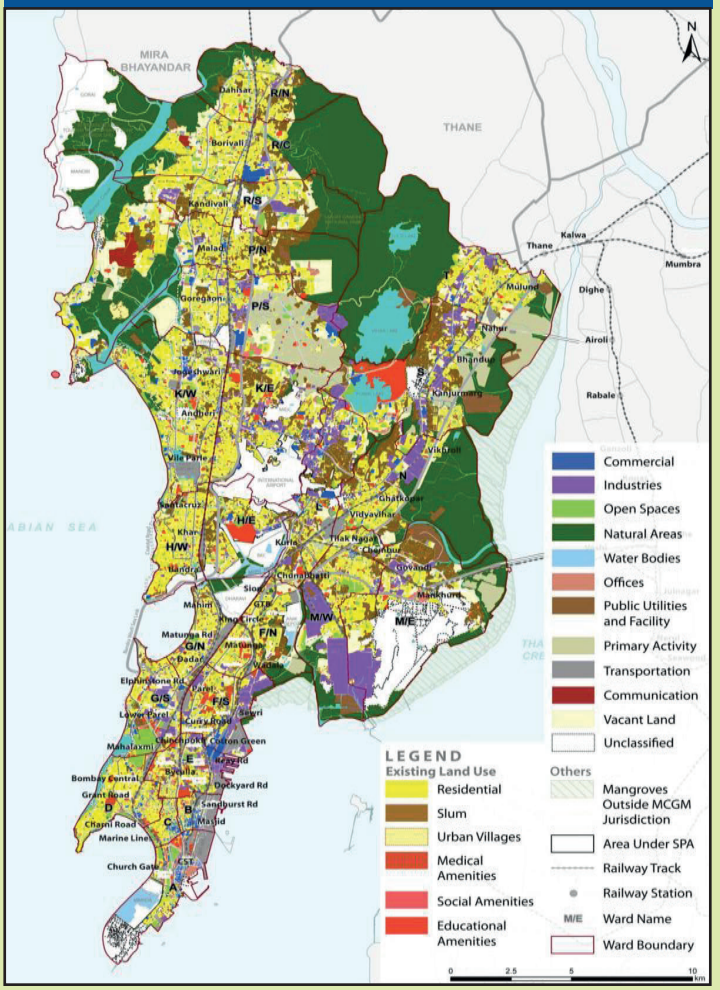
In the year 2024, if consider the area and population of Brihanmumbai, the area of Mumbai city is 72.1 sq. km Area of western suburb is 232.55 sq. km. and the area of the eastern suburb is 178.57 sq. km And the estimated population of the said division is 3238160, 5801729, 4020292 respectively.

5. LAND USE

The Brihanmumbai Municipal Corporation was the first Municipal Corporation to adopt the concept of a development plan. The first development plan was formulated in 1964 and was sanctioned in 1967. This development plan was revised as per the provisions of Maharashtra Regional and Town Planning Act, 1966. The Sanctioned Revised Development Plan 1991 came into force in 1991-94. This plan was valid up to 2014. Brihanmumbai Municipal Corporation revised the Sanctioned Revised Development Plan 1991 during the period 2014-2018. The Development Plan for 2014-2034 was submitted to State Government under provision of section 30(1) of said Act on 02.08.2017 for sanction.

The State Government in accordance with the sub section (1) of section 31 of the Maharashtra Regional and Town Planning Act, 1966 have accorded sanction to the Draft Development Plan of Greater Mumbai with modification show in schedule-A appended to the notification No.T.P.B.-4317/629/CR-118/2017/ DP/UD-11 May-2018 excluding substantial modifications as shown in schedule-B appended thereto. As per the notification dt.22.06.2019 the sanctioned D. P. 2034 is in effect from dt.01.09.2018. As per notification dt.21.09.2018 the sanctioned excluded part of Development Control and Promotion Regulation 2034 is in effect from dt.13.11.2018. The State Government has sanctioned some of the EPs vide notification dt.22.01.2019, dt.25.01.2019, dt.31.01.2019, dt.17.9.2019, dt.23.11.2019, dt.05.11.2020 dt.12.03.2021, dt.12.04.2021, dt.04.05.2021, dt.28.05.2021, dt.04.10.2021, dt.11.03.2022, dt.31.05.2022, dt.19.07.2022, dt.27.07.2022, dt.12.09.2022 & dt.24.03.2023 . dt.12.05.2023 and on dt.28.12.202 The balance Excluded Parts will be sanctioned by State Government in the due course.

Map 5.1: Development Plan



Planning Area:

The ELU 2012 located the emergence of an additional area of 14.96 Sq.km, probably due to siltation of Thane creek. This area which comprises of Mangroves in within the Brihanmumbai Municipal Corporation limits and is shown as Natural Area in Development Plan 2034.

The Coastal Road approved by GoM will add an additional area of 1.80 sq.km through reclamation of the sea. The alignment of this Road is marked on the Proposed Land Use (PLU). Any changes in the alignment of Coastal Road that would get necessitated during implementation would automatically become part of the DP-2034. Further, an area of 1.20 sq.km is proposed as green reclamation.

The addition of these land makes Brihanmumbai Municipal Corporation's total land area 476.24 sq.km. Brihanmumbai Municipal Corporation is Planning Authority for about 434.55 sq.m (91.24%) excluding the area coming under various Special Planning Authority (SPA).

Following SPAs exist in Grater Mumbai :

1. Mumbai Metropolitan Regional Development Authority (MMRDA).
2. Slum Rehabilitation Authority (SRA)–for approval of Slum Rehabilitation projects.
3. Maharashtra Industrial Development Corporation (MIDC).
4. Mumbai Port Trust (MbPT)
5. Maharashtra Housing Area Development Authority (MHADA) – for approval of MHADA projects

Coastal Regulation Zone:

Ministry of Environment & Forest (MoEF) has issued CRZ notification vide No. S.O. 19 (E) dated 06.01.2011, in supersession of the earlier notification S.O. 114 (E) of 19.02.1991. This notification is superseded by the CRZ notification vide no. GSR 37(E) dt. 18.01.2019.

Coastal Regulation Zone Notification-2019:

The objectives of the new CRZ Notification includes (1) ensure livelihood security to the fisher communities, (2) protect the Coastal environment, (3) promote sustainable development.

Government of India in the erstwhile Ministry of Environment and Forests under number S.O.19 (E), dated the 6th January, 2011 the Central Government declared certain coastal stretches as Coastal Regulation Zone (referred as CRZ notification-2011).

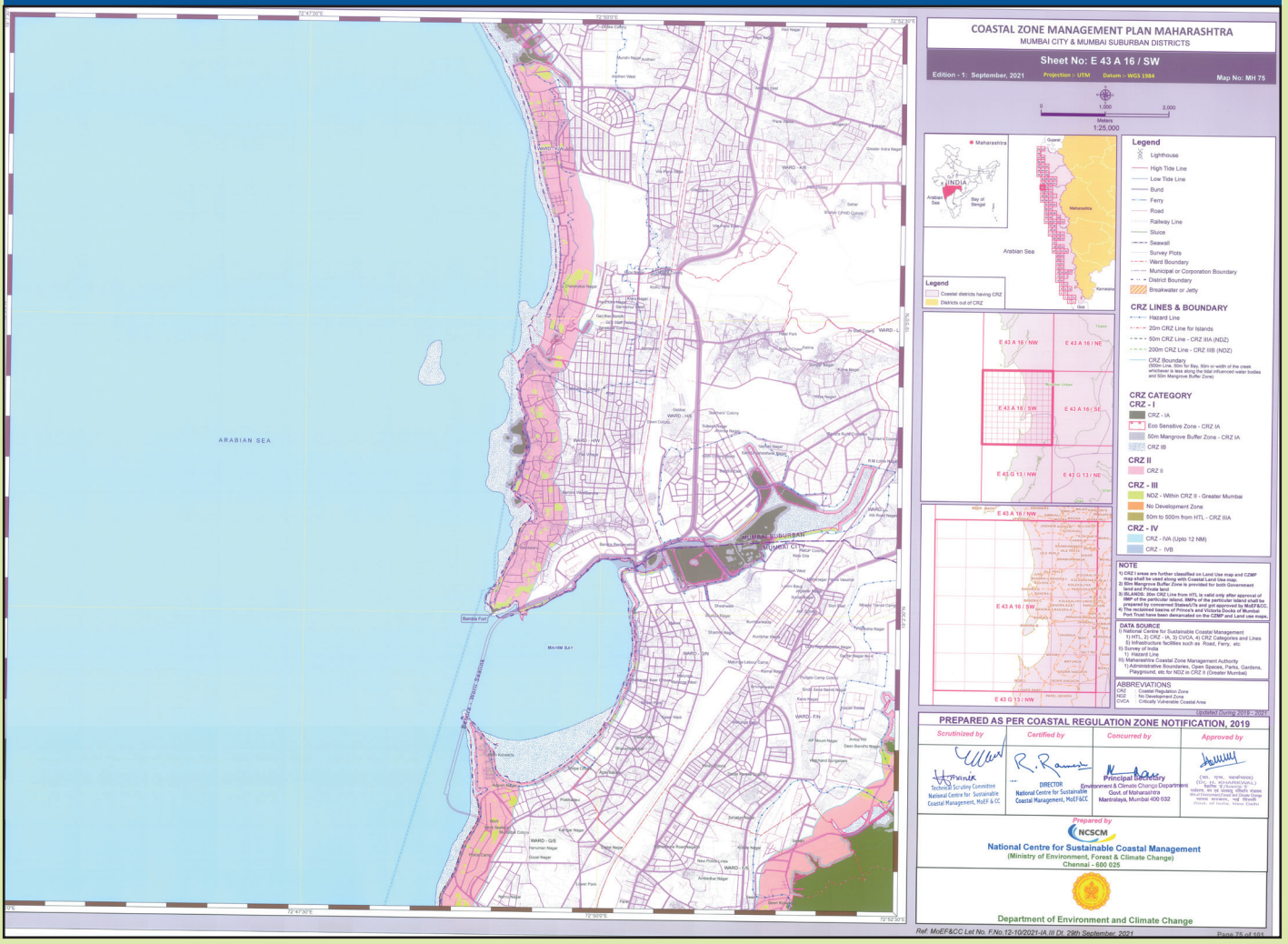
Various State Governments and Union territory administrations and stakeholders have requested the Ministry of Environment, Forest and Climate Change to address the concerns related to coastal environment and sustainable development with respect to the Coastal Regulation Zone Notification, 2011.

Thereafter in exercise of the powers conferred by sub-section (1) and clause (v) of subsection (2) of section 3 of the Environment (Protection) Act, 1986 (29 of 1986) and in supersession of the Coastal Regulation Zone Notification 2011, number S.O. 19(E), dated the 6th January, 2011, MINISTRY OF

ENVIRONMENT, FOREST AND CLIMATE CHANGE has issued Notification dt 18th January, 2019 (referred as CRZ Notification-2019).

Additional director & Member Secretary (CRZ) vide letter dt. 29 th Sept. 2021 informed that based on recommendation of the NCZMA, the Ministry of Environment. Forest and Climate Change hereby conveys its approval of the CZMPs for the Mumbai City and Mumbai Sub-Urban in the State of Maharashtra.

Map 5.2: Costal Regulation Zone area of Mumbai (Draft)



6. MANGROVES IN MUMBAI

Constitution of Mangrove Cell:

Mangrove Cell was constituted by the Government of Maharashtra in the wake of serious public concerns about mangrove loss in the State, particularly in Mumbai and surrounding areas. The establishment of the Mangrove Cell in 2012, initiated a series of measures for conservation of mangroves in Maharashtra. The Cell is headed by the Additional Principal Chief Conservator of Forests (APCCF). A Deputy Conservator of Forests (DCF) has been appointed to boost Mangrove Conservation in Maharashtra.

In 2013, the State government ramped up efforts and elevated the status of mangrove forests on Government land from 'Protected Forest' to 'Reserved Forest'. The Mangrove Cell also facilitated the establishment of Mumbai Mangrove Conservation Unit in 2014 to specifically cheek and prevent the destruction of mangroves in Mumbai and surrounding regions.

There was also an urgent need to promote research, education, ecotourism etc. to secure the biodiversity of our coastal and marine environment and to bring tangible benefits to the coastal communities. For the mission, creating an institution with the necessary skill set and the operational flexibility to address this complex task was under the consideration of the state government, that led to the establishment of a "Mangrove and Marine Biodiversity Conservation Foundation of Maharashtra" (Mangrove Foundation, in short), The Foundation was registered in the year 2015 under the Societies Registration Act, 1860.

Function of Mangrove Cell:

Mangrove Cell functioned extensively for mangrove conservation by taking block by block approach from raising mangroves on nurseries and organizing regular large - scale plantations on degraded mangrove areas to conducting Clean Mangroves Campaigns and awareness programmes.

The Mangrove Cell also forged strong partnerships with many leading national institutions and agencies, facilitating the introduction of state - of - the - art technologies and best practices in sustainable livelihoods to the Maharashtra shores. National Institute of Oceanography (NIO), Central Marine Fisheries Research Institute (CMFRI), Central Institute of Fisheries technology (CIFT),Central Institute of Brackish Water Aquaculture (CIBA), Marine Product Export DevelopmentAuthority (MPEDA), Wildlife Institute of India (WII), Salim Ali Canter for Ornithology and Natural History (SACON) and Bombay Natural History Society (BNHS) are just a few names in that long and illustrious list of partners. Mangrove Cell also works with several NGOS, Citizen's Groups, educational institutions and private research organizations.

Based on the 'International Climate Initiative' Agreement between Government of India and the

Federal Republic of Germany, a bilateral project towards improving conservation of marine biodiversity called “Sustainable Management of Coastal and Marine Protected Areas” (SM-CMPA) was launched in Maharashtra with the help of the German development agency called GIZ. The project led to the notification of the Thane Creek Flamingo Sanctuary in 2015. Spread over on area of about 17 square kilometres with 896 Ha of Mangrove cover, it is home to over 200 species of birds, many of which are migratory like the splendidly -coloured flamingo which arrive in thousands in October- November. A ‘Coastal and of Marine Biodiversity Centre’ was set up at Airoli, Navi Mumbai, in 2017 as a part of the GIZ Project. This interpretation and orientation centre for mangroves and marine biodiversity serves as a gateway to the Thane Creek Flamingo Sanctuary for tourists and environmentalists.

Activities of Mangrove Cell – Maharashtra Forest Departments

1. Mangrove Protection
2. Mangrove Conservation and Livelihood Generation Scheme
3. Mangrove Afforestation
4. Clean – up Campaign
5. Awareness generation
6. Coastal and Marine Biodiversity Central and mangrove Parks in Mumbai

1. Mangrove Protection:

Mangrove Forests on Government land are declared either as ‘Reserve Forest’ as per the Indian Forest Act, 1927. Mangroves on private land are declared as ‘Forest’, hence provision of Forest Conservation Act 1980 is invoked for the diversion of these forests. In Mumbai Mangrove Conservation Unit (MMCU) a total of 7447.202 hectors of land is declared as Reserve Forest.

- A specialized unit, called Mumbai Mangrove Conservation Unit (MMCU), has been formed to Check the increased pressure of development, waste dumping, pollution and encroachment in mangrove areas of the Mumbai Metropolitan Region.
- Patrolling is intensified in all mangrove areas.
- Considering the high vulnerability to encroachment and debris dumping in the mangrove area of Mumbai, Mumbai Suburban region and Thane the Mangrove Cell has employed the services of the Maharashtra State Security Corporation from December 2017 and a total of 184 Guards have been deployed for protection of mangroves in Thane, Mumbai and Mumbai Suburban districts.
- The illegal shanties, which had cropped up on mangrove lands in various parts of Mumbai, have been given notices for evacuation and many of them have been removed.

- In an effort to closely monitor the status of mangroves in Maharashtra, Satellite mapping of mangroves areas is carried out, district by district, on a 1:5000 scale and the areas in the possession of Forest Department are being demarcated on the ground.
- The Mangrove Cell has now engaged the Indian Institute of Space Science and Technology (IIST) which will monitor the health of mangroves in Maharashtra using
- near real time satellite remote sensing data. Implementation of 'Mangrove Conservation and livelihood Generation Scheme' for providing livelihood associated with mangrove habitats in order to establish sustainable mangrove conservation by local communities and enabling them to receive tangible benefits from protecting this ecosystem is being undertaken. Total 20 villages are taking advantage of the scheme.
- Capacity Building of Staff for effective conservation and protection measures.

2. Mangrove Conservation and Livelihood Generation Scheme:

- The Scheme was imitated on 20 th September 2017 by Government of Maharashtra in the coastal districts of Maharashtra, to conserve mangroves on both private and government lands. The Scheme aims to provide benefits to individuals and community members of selected Villages.
- Based on the current mangrove cover, about 18 villages from Thane have been selected for implementation of the scheme activities by Mangrove Cell, Maharashtra Forest Department and The Mangrove Foundation.
- To ensure participation of the local communities, the Scheme is being implemented through village - based Mangroves Co- Management Committees (MCMC). Through this Scheme a group activity is entitled to 90:10% of subsidy while an individual (land owners with more than 1 acre mangrove) will get 75:25% subsidy through the scheme, the following activities are being implemented across various villages along the coastline of MMCU:

i. Crab Farming

ii. Fish Cage Culture (Asian Sea Bass)

iii. Oyster and Mussel Farming

iv. Ornamental Fish Culture

v. Mangrove Ecotourism

vi. Mangrove Seed Collection

3. Mangrove Afforestation:

- Mangrove sapling have been raised in nurseries for establishing mangrove plantations in different coastal districts of the state.
- Since 2023-24 a total area of 9.5 hectares distributed over 03 locations across Mumbai and Thane has been covered under mangrove plantation programme and the a total of 42,218 lakh mangrove saplings have been planted.

4. Clean - up Campaign:

- Annual Mangrove Clean – up programmes are conducted to create awareness
- The Clean Mangrove Campaign, a three- year initiative started in 2015, by the citizens of Mumbai city and Mangrove Cell, made it to the Limca Book of Records. This was one of the biggest governments - citizen partnership projects. In 2023-24, through this campaign 45,303 kg of garbage (mostly plastic) was cleared, involving about 16,831 Volunteers across Mumbai.

5. Awareness generation:

- Development of 'Coastal and Marine Biodiversity Centre' (CMBC) at Airoli, Navi Mumbai.
- Regular Environment education and awareness talk for students and the public in general.
- Celebration of important Nature and Wildlife days to create awareness about the pressing subjects.

6. Coastal and Marine Biodiversity Central and mangrove Parks in Mumbai:

- The Mangrove Cell, Maharashtra Forest Department has developed a Coastal and Marine Biodiversity Centre (CMBC) at Airoli, Navi Mumbai in collaboration with the German agency GIZ under the Indo-German Biodiversity Programme.
- The major attraction at the Centre are:

  i. Vibrant and colourful exhibits of the rich coastal and marine biodiversity observed in the Thane Creek Flamingo Sanctuary.

  ii. Sounds of various birds like Flamingo, Kingfisher etc. and marine animals like Indian Ocean Humpback Dolphin and Blue Whale.

  iii. Interactive computer screens and wide LED displays showcasing interesting information and photographs about coastal and marine biodiversity.

  iv. A theater room which shows documentary films and on the biodiversity of Thane Creek Flamingo Sanctuary.

v. A tourist board for flamings safari is also operated from this centre for tourists.

- The Mangrove Cell will be establishing a Giants of the Sea museum at CMBC Airoli. This museum will house life-size exhibits of giants sea animals such as giant sea animals such as Giant Squid, Whale Sharks and also skeletons of blue whales and other Marine animals.
- In the near future the Mangrove Cell also plans to set up mangrove parks at Dahisar and Mahul which will have various attractions for tourists such as mangrove trails, bird trials and watch tower, kayaking, mangrove museum, glass bridge over mangroves, etc.
- Mangrove Park Gorai is developed the said project is to be completed in the financial year 2024-25 under the District Annual Plan (General). Anadministrative order for the amount of Rs. 25.30 crores has been received and \the work of the said project is in progress.

7. URBAN RENEWAL SCHEME

The old dilapidated buildings of the Brihanmumbai Municipal Corporation and on rental basis will redeveloped by the Development Regulations to take up the city renovation plan by the Brihanmumbai Municipal Corporation and Maharashtra Housing and Area Development Authority (MHADA), a government authority involved in the housing sector and make such open spaces available for various civic amenities.

Table No. 7.1: Recreation Facilities Provided in the Mumbai for the year 2023-24

Sr. No.	Particulars	City	Total No. (Up to 31.03.2024)		
			Western suburbs	Eastern Suburbs	Total
1	Garden (Except strip Gardens)/ Park	21	168	112	301
2	Recreation Grounds	183	204	97	484
3	Playgrounds	49	193	116	358
4	Shilpgram	0	1	0	1
5	Fountains	17	17	8	42
6	Band stands	1	1	1	3
7	Nurseries	12	9	7	28
8	Plant Sale Counter	10	9	6	25
9	Statues	56	10	14	80
10	Tree Plantations	15346	29046	27820	72212
11	Sales of plants	5579	1435	1031	8042
12	Distribution of plants	12209	8084	2884	23177
13	Number of dead and dangerous tress removed	278	261	115	654
14	Trees trimmed for balancing	49437	57827	22465	129729
15	Deconcretized trees	305	2152	570	3027
	Total No. of Tress	**718589**	**1221737**	**1034957**	**2975283**

Source: Garden Department of BMC

RECREATIONAL FACILITIES:

Providing recreational amenities to the public is a discretionary duty of the Corporation under section 63 of MMC Act1888. For balanced environment, abatement of air pollution and Green Mumbai, beautiful and clean Mumbai, Brihanmumbai Municipal Corporation provides recreational amenities to the citizens of this city by way of maintaining gardens and providing playgrounds (PG), recreational centres, water fountains, etc. In addition to recreation, Brihanmumbai Municipal Corporation also encourages sports, art, cultural programs etc. Whereas health education and health promotion of citizens being its objective (Table No. 7.1). These facilities are utilized by citizens as well as others from different places.

Table No. 7.2: Recreation Facilities Created in the year 2023-2024									
Sr. No.	Details	Recreation Facilities							
		Zone-1	Zone-2	Zone-3	Zone-4	Zone-5	Zone-6	Zone-7	Total
1	Garden (Except strip Gardens)/ Park	3	18	42	79	50	62	47	301
2	Recreation Grounds	70	113	56	87	47	50	61	484
3	Playgrounds	24	25	40	66	61	55	87	358
4	Shilpgram	0	0	1	0	0	0	0	1
5	Fountains	8	9	3	4	2	6	10	42
6	Band stands	1	0	1	0	0	1	0	3
7	Nurseries	6	6	3	3	3	4	3	28
8	Plant Sale Counter	6	4	3	3	3	3	3	25
9	Statues	47	9	5	1	6	8	4	80
10	Tree Plantations (Traditional method)+ (Miyawaki method)	479	14867	2300	17224	24576	3244	9522	72212
11	Sales of plants	5446	130	570	865	733	298	0	8042
12	Distribution of plants	10475	1734	2245	4500	2024	860	1339	23177
13	Number of dead and dangerous tress removed	106	172	100	108	65	50	53	654
14	Trees trimmed for balancing	15898	33539	17600	20406	8474	13991	19821	129729
15	Deconcretized trees	93	212	198	522	193	377	1432	3027
	Total No. of Tress	**255118**	**463471**	**337716**	**643505**	**411745**	**623212**	**240516**	**2975283**

8. UDYAN AND ZOO

Veermata Jijabai Bhosale Botanical Udyan & amp; Zoo is one of the oldest zoos in the country & was established in 1862. This area was under the control of Agri- Horticultural Society of Western India. The management of this Udyan & Zoo was handed over to MCGM by the then state govt in 1873. The total area of this Udyan & amp; Zoo is approx. of 53 acres and is declared as “Heritage Grade II (B)” site. This Udyan- Zoo has been recognized as ‘Medium Zoo’ up to 25-12-2025 by Central Zoo Authority, New Delhi.

Visitor data and revenue

Financial Year	No. of Visitors	Revenue (Rs.)
2022-2023	28,55,418	11,17,37,386/-
2023-24	30,16,827	11,98,37,171/-

Garden Department:

For tree conservation, Garden department has done following work:

- In year 2023-24, a total of 72212 trees are planted on municipal roads and available open spaces of which 13234 trees are planted by traditional method and 58978 by miyawaki method. Plantation of more than 5 lakh trees by Miyawaki method has been done till date.
- Removal of concrete and cement from around 3027 no. of tress.
- Spraying of insecticides and pesticides on infected tress.
- " Trimming of 129729 tree branches to balance the trees.
- Formation of Tree basins around the tress.
- Removal 654 no. of dead and dangerous tress
- During 2023-24, the Brihanmumbai Municipal Corporation And the Tree Authority was organised the 27th exhibition of plants, flowers, fruits and vegetables from 2nd February to 4th February 2024 at Veermata Jijabai Bhosale Botanical Udyan & Zoo. To create consciousness and awareness about environment among the citizens, the workshop on various horticultural subjects was also arranged from 9h February to 11h February 2024.
- "In T ward of eastern suburb, flower exhibition was organised at Dr.C.D.Deshmukh Udyan, Mulund (East) from 10h February to 11" February 2024.
- In the year 2024-25, around 25000 trees are proposed to planted on roadside and on other places in BMC jurisdiction.

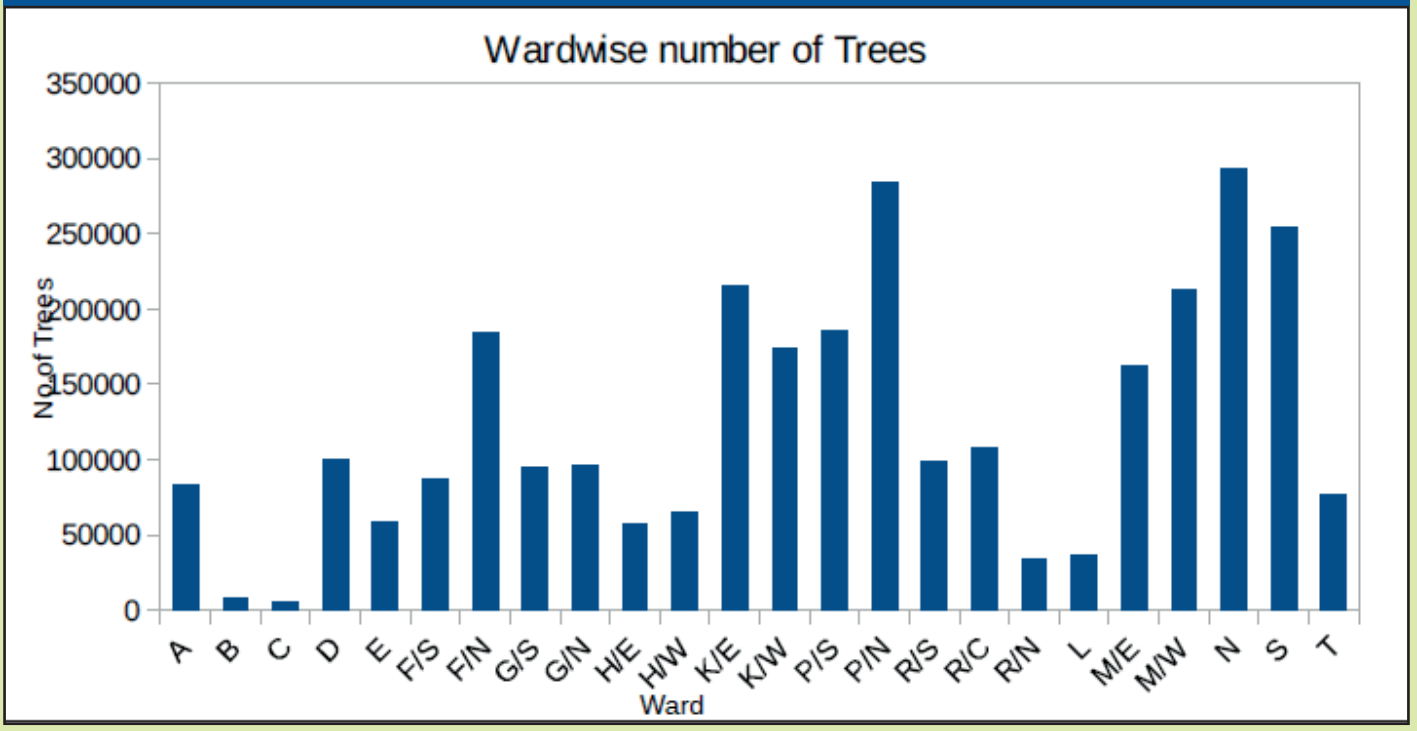
- As per tree census, total no. of trees in 24 wards is 29,75,283.
- "A draft copy of handbook titled 'Greening Mumbai' has been published on the BMC website for citizens awareness.

Table No 8.1: Wardwise Numbers of Trees

Sr. No.	Ward	No. of tress	Sr. No.	Ward	No. of tress
1	A	83201	14	P/South	186002
2	B	7816	15	P/North	284271
3	C	5756	16	R/South	98305
4	D	100317	17	R/Central	107841
5	E	58028	18	R /North	34370
6	F/South	87240	19	L	36023
7	F/North	184837	20	M/East	162638
8	G/South	94774	21	M/West	213084
9	G/North	96620	22	N	292965
10	H/East	57314	23	S	254038
11	H/West	64674	24	T	76209
12	K/East	215728	T	357174	358434
13	K/West	173232		**Total**	**2975283**

Source: Development- Planning and Health Depts of BrihanMumbai Municipal Corporation

Chart No. 8.1: Wardwise Number of Trees



Veermata Jijabai Bhosale Udyan and Zoo at present:

- As on 31st March 2024, there are in all 314 animals, which include 69 mammals of 11 Species, 223 Birds of 15 species and 22 Reptiles & aquatic animals of 6 species displayed in this Udyan & Zoo.
- Veermata Jijabai Bhosle Botanical Udyan and Zoo is a plastic-free zone, hence bringing single-use plastic items into the zoo has been completely banned since October 2023. The seating benches have been made by recycling single-use plastic bottles collected from tourists. These benches have been installed in the zoo for the convenience of tourists.
- The Zoo has now become paperless by way of full-fledged online ticketing system and self-ticketing kiosks have been installed at the Zoo entrance for visitors' usage.
- Battery operated E-vehicles have now been purchased by the Zoo and soon they will be made operational for the use of Senior citizens and common visitors.

Under modernization development works, approx. 105 trees of various 29 Indigenous species have been newly planted inside/nearby all the animal exhibits which has helped to maintain the biodiversity.

9. WATER SUPPLY

Mumbai receives raw water from seven impounded water resources viz. Vihar and Tulsi within Mumbai and Tansa, Modak Sagar, Upper Vaitarna, Middle Vaitarna and Bhatasa located at a distance of about 100 to 175 Kms from Mumbai.

Raw water available from these sources is conveyed with transmission main system ranging from 2235 mm to 5500 mm diameter pipelines and tunnels to the state of the art water treatment facilities at Bhandup Complex (2500 MLD) and Panjrapor (1365 MLD). Water Treatment facilities for Tulsi (14 MLD) and Vihar (100 MLD) are located near to these sources. At these treatment plants, water is treated with processes such as coagulation, flocculation, settling, rapid sand filtration and post-Chlorination and quality of the effluent water is maintained in accordance with IS 10500 : 2012 - Drinking water Specifications.

Table No. 9.1: Source of Water Supply

Source	Yield in MLD	Ownership	Distance from City	Treatment Plant
Tulsi	14	Brihanmumbai Municipal Corporation	City Limit	Tulsi
Vihar	100	Brihanmumbai Municipal Corporation	City Limit	Vihar
Tansa	448	Brihanmumbai Municipal Corporation	100 KM from City	Bhandup Complex
Modak Sagar	1769	Brihanmumbai Municipal Corporation	100 KM from City	Bhandup Complex
Upper Vaitarna Middle Vaitarna		Government of Maharashtra Brihanmumbai Municipal Corporation	173 KM from City	Bhandup Complex
Bhatsa	2039	Government of Maharashtra	100 KM from City	Bhandup Complex and Panjarapur
Subtotal	4370	-	-	-
Enroute + Losses	-395	-	-	-
Total Supply to City	3975	-	-	-

Source: Hydrolic Eng Dept

The treated water is stored in the Master Balancing Reservoirs (MBR) located near to treatment plants at Bhandup Complex (within Mumbai) and Yewai (Outside Mumbai). It is further distributed to 27 service reservoirs located throughout Mumbai City with water supply network of about 450 Kms this conveyance system remains charged for 24 hours and eliminates the chances of water contamination because of intrusion of ground water/sewage etc. There is 3975 MLD water supply to Mumbai.

Population Projection, Demand and Augmentation of Water Supply

The population growth trend of Mumbai is continued. The projected population of Mumbai is anticipated 17.24 million by the year 2041. The projected water demand for 2041 is 6535 MLD (including enroute supply and transmission losses). The process of developing Government allotted Gargai (440 MLD), Pinjal (865 MLD) and Damanganga-Pinjal River Link Project (1586 MLD) water supply sources to meet the future water demand. On completion of these projects, the water supply will be augmented by 2891 MLD.

Brief note regarding activities at Bhandup Complex Water Treatment Plant:

Mumbai city and suburban areas are being supplied with 3975 million liters of water on a daily basis. This water is drawn from various lakes as well as river sources. Out of above 3975 MLD water ,2500 MLD is treated at Bhandup Complex and is supplied to city and western suburban wards.

Water is brought to Bhandup Complex by gravity mains originating from Tansa / Bhatsa/ Vaitarna / Upper Vaitarna lakes. This water is prechlorinated at Yewai @ 50 Kms upstream of Bhandup Complex. Water received at Bhandup Complex is then treated using conventional treatment methods such as pretreatment/ filtration/ post chlorination and is then distributed through Master Balancing Reservoir(MBR) to consumers through network of pipelines, tunnels, service reservoirs etc..

During all these activities, water samples at each stages of treatment are collected and tested for various parameters . The laboratory at Bhandup Complex is working round the clock for this purpose and quality of final water leaving Bhandup Complex is always maintained within prescribed limits as per drinking water standards IS 10500 :2012.

Brief note regarding working activities at Bhandup Complex and Pise Panjarapore Complex Laboratory:

Laboratory at Bhandup Complex and Panjrapur Complex was commissioned in the year 1980 for daily monitoring the quality of water having supplied to Mumbai.

Analysis of water for Physical, chemical and bacteriological parameters in order to supply safe potable water as per IS 10500 : 2012 to the Mumbai city.

Samples of raw water, clarifier water, filtered water and final water are tested for following parameters hourly.

1. Turbidity - (Every Hour)
2. pH - (Alternate Hour)
3. Residual Chlorine - (Alternate Hour)
4. Temperature - (Alternate Hour)
5. Colour - (Alternate Hour)

Jar test is conducted on Raw water sample in every shift for prescribing optimum Poly Aluminium Chloride dose. Complete analysis of water samples – Raw, Filter and Final is carried out for Total Alkalinity, Total Hardness, Calcium Hardness, Chlorides, Suspended solids, Total solids, Manganese, Iron, Aluminium, Dissolved Oxygen and Bacteriological examination for total coliform and E.coli once in a day.In general total 760 no. of tests are being carried out on daily basis.

Table No.9.2: Water Quality at Source (Raw) and Treated (Final) during April 2023 to March 2024

Parameters	Tulsi		Vihar		Bhandup Complex		Panjrapur (Bhatsa)		BIS standards 10500:2012
	Raw	Final	Raw	Final	Raw	Final	Raw	Final	
Turbidity NTU	1.5-9.2	0.19-5.0	1.5-9.5	0.76-4.9	1.3-52	0.19-3.8	1.6-467	0.23-5.6	1-5
pH	7.05-8.35	6.90-7.65	7.30-8.95	7.20-8.35	7.25-7.85	7.05-7.60	6.9-7.8	6.8-7.5	6.5-8.5
Chlorides (mg/l)	10-18	12-24	10-24	13-30	8-14	10-16	8.0-48	11-54	250-1000
Total Alkalanity (mg/l)	23-41	23-40	34-48	31-45	33-44	30-43	28-89	24-81	200-600
Total Hardness (mg/l)	35-51	33-49	37-56	40-54	40-50	36-48	25-113	21-101	200-600
Bacteriological examination (CFU/100ml)									
Total Coliform	0-0	0-0	0-0	0-0	6-75*	0-0	≥ 1600	0-0	-
E-Coli	0-0	0-0	0-0	0-0	0-5	0-0	≥ 1600	0-0	-

Source: Source: Hydraulic Engineer Department.
Note : Raw water of Tulsi, Vihar and Bhandup complex plant is pre-chlorinated. Raw water Bhandup Complex contains water from sources Tansa, Modaksagar (Vaitarna), Middle Vaitarna and Upper Vaitarna.
Results of all parameters for final water of Bhandup Complex, Tulsi Filtration Plant and Vihar Filtration Plant are within Permissible Limit as per IS 10500 : 2012.
Unit : NTU= Nephelometric Turbidity Unit
mg/l = miligram per litre
CFU/100ml=Colony forming unit per 100 ml

Municipal Analyst Laboratory:

Municipal Analyst laboratory is a Public Health Laboratory of Brihanmumbai Municipal Corporation and a State Food Testing Laboratory recognized by the Food Safety And Standard Authority Of India (FSSAI) located in G/ North, Dadar. In December 2020 the Laboratory has been accredited with International Standard ISO17025:2017 by National Accreditation Board For Testing and Calibration (NABL). Since January 2023, the laboratory has implemented software systems Food And Water Quality Monitoring System (FWQMS) and website is https:// fwqms.mcgm.gov.in. to streamline day-to-day operations and provide analytical reports in a quick and easy manner.

Activities of Municipal Analyst Laboratory:

- The laboratory provide testing service to Brihanmumbai Municipal Corporation and citizens for Chemical and Microbiological analysis of food and water samples using advance techniques as per National and International Standards.
- The Municipal Analyst laboratory supports the Public Health Department, Epidemiology cell by testing drinking water sample, Hawkers and Ice water samples for Water quality surveillance undertaken by the Epidemiology cell of Public Health Department.

Testing of Drinking Water surveillance samples:

The treated drinking water is supplied all over Mumbai region through the piped distribution system. Drinking water in distribution system may get contaminated by infectious microorganisms present in the environment. In order to protect public health as per the World health organization (WHO) guidelines verifying that safe drinking water is supplied till the consumer end, monitoring the drinking water supply throughout the distribution network is essential. For monitoring quality of drinking water daily around 180-220 samples and in monsoon or in an emergency upto 280 drinking water samples are jointly collected by the Public Health Department (PHD) and Hydraulic Engineering (HE)Department. The water samples are collected from the service reservoirs and sampling points throughout the distribution network across 24 wards of Mumbai by the staff of Medical Officer Of Health (MOH) for PHD, Assistant Engineer Water Works- Quality Control and Assistant Engineer Water Works / Leak Detection Department for HE Departments. These water samples are sent to the Municipal Analyst laboratory for Routine Bacteriological analysis.

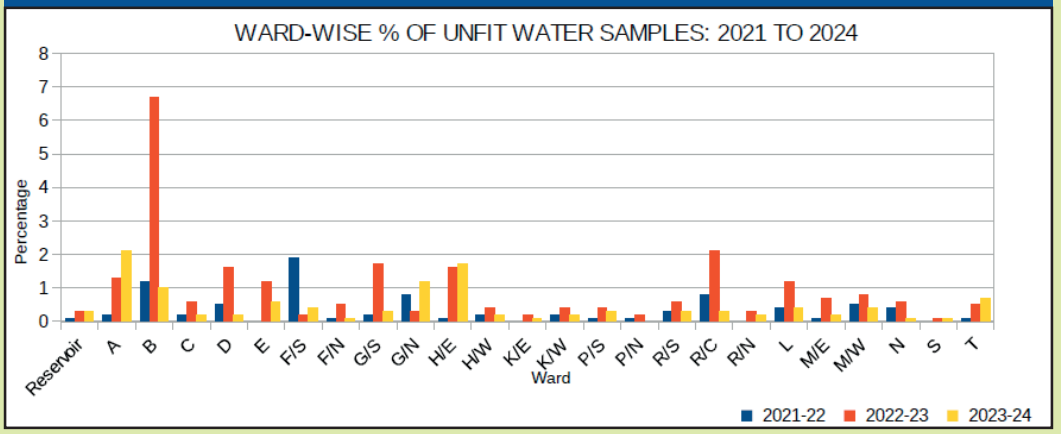
In Municipal Analyst laboratory, Bacteriological Quality of all the drinking water samples taken from the distribution system including consumer's premises are tested in accordance to Indian Standard - Drinking Water - Specification IS: 10500:2012 by Indian Standard IS- 15185:2016 . As per The Indian Standards IS 10500:2012 Drinking Water Specification prescribes that E.coli and Total Coliform bacteria shall not be detectable in any 100 ml sample of Treated water entering the distribution system and Treated water in the distribution system. The Membrane Filtration Technique (MFT) is used to detect these water quality indicator bacteria. The MFT technique is performed as per the BIS standards .The confirm results are obtained within18- 24 hours. The Medical Health Officer (MOH) of 24 Wards, Deputy Executive Health Officer (Epidemiology Cell), AEWW-QC and AEWW-LD Departments obtained these results through the software system FWQMS withing 24 hours through their authorized login. This enables for taking quick remedial measure on unsafe water sample location.Which helps to control the percentage of unsafe water samples.

Table No. 9.3: Wardwise % of Unfit water Samples April 2021 – March 2024									
Sr. No.	Ward	% of Unfit Samples			Sr. No.	Ward	% of Unfit Samples		
		2021-2022	2022-2023	2023-2024			2021-2022	2022-2023	2023-2024
1	Service Reservoir	0.1	0.3	0.3	14	K/W	0.2	0.4	0.2
2	A	0.2	1.3	2.1	15	P/S	0.4	1.2	0.4
3	B	1.2	6.7	1.0	16	P/N	0.1	0.7	0.2
4	C	0.2	0.6	0.2	17	R/S	0.5	0.8	0.4
5	D	0.5	1.6	0.2	18	R/C	0.4	0.6	0.1
6	E	0.0	1.2	0.6	19	R/N	0.1	0.2	0.0
7	F/S	0.1	0.5	0.1	20	L	0.1	0.4	0.3
8	F/N	1.9	0.2	0.4	21	M/E	0.8	2.1	0.3
9	G/S	0.8	0.3	1.2	22	M/W	0.0	0.3	0.2
10	G/N	0.2	1.7	0.3	23	N	0.3	0.6	0.3
11	H/E	0.1	1.6	1.7	24	S	0.0	0.1	0.1
12	H/W	0.2	0.4	0.2	25	T	0.1	0.5	0.7
13	K/E	0.0	0.2	0.1	**Mumbai Average**		**0.33**	**0.99**	**0.46**

Source: This Information is received from G/N water Analyst Laboratory of BrihanMumbai Municipal Corporation

Ward-Wise % of Unfit Water Samples from April 2022 - 23 to March 2023 - 24 shows decreasing trend

Chart No. 9.1: Ward-Wise % of Unfit Water Samples: 2021 to 2024



Water Supply Projects

Future Sources of Water Supply to Mumbai:

The gap between demand and supply for the year 2041 is 2840 MLD. To meet the gap and to increase the water supply to Mumbai City & Suburbs, it is proposed to undertake development of following sources for augmenting water supply of Mumbai.

Table No. 9.4: Future sources of water supply		
Sources	Yield in MLD	Ownership
Gargai	440	BrihanMumbai Municipal Corporation
Pinjal	865	BrihanMumbai Municipal Corporation
Damanganga-Pinjal River Link Project	1586	Govt. of India/Govt. of Maharashtra/Govt. of Gujrat
Desalination project	200	BrihanMumbai Municipal Corporation
TOTAL	**3091**	

Source: BrihanMumbai Municipal Corporation Hydraulic Engineer

1. Gargai Project consists of construction of dam and tunnel of about 2 Kms. The vetting of Components of DPR by CDO Nashik is completed except for outlet division. MoTA Clearance is received and Forest, Wildlife Clearance from MoEFCC is in process. Joint measurement survey of submerged land as well as rehabilitation and resettlement land is completed. The land for afforestation is identified and suitability certificate for the same is received. This project will augment Mumbai's water supply by 440 MLD.

2. Pinjal project consists of construction of dam across Pinjal River, conveyance system and allied works like Water treatment plant, Master balancing reservoir, pumping station etc. Brihanmumbai Municipal Corporation has appointed Consultancy Services for obtaining Environmental, Forest/ Wildlife clearances from Competent Authorities including socio and environmental impact assessment studies and enumeration of trees for Pinjal Project.

3. Under 'River Linking Programme' initiated by Government of India; it is proposed to link Damanganga & Pinjal rivers and thereby 1586 MLD water would be made available to Brihanmumbai Municipal Corporation and this water will be conveyed into Pinjal reservoir after its completion.

4. Brihanmumbai Municipal Corporation, has now also planned to augment water supply by 200 MLD by construction of a Desalination plant which will provide a climate change resilient and reliable source of water for Mumbai. The final detailed project report (DPR) incorporating provisions for operational flexibility, utilization of 100% Green power for operation of plant has been completed in September 2023 and the tender is invited on the basis of international competitive bidding in March 2024.

Projects under Water Supply Project Department are as follow :

1. Construction of new water treatment plant of capacity 2000 MLD at Bhandup Complex :

After the feasibility study of existing 1910 MLD WTP at Bhandup Complex and recommendations of Technical Advisory Committee & IIT Bombay thereon, tender was invited to construct new 2000 MLD capacity WTP at Bhandup Complex with minimum foot print area of 7 hectors & aiming to eliminate release of waste water/zero discharge into the environment. Letter of Acceptance is issued to lowest bidder M/s. Welspun Enterprises Ltd. on 29.02.2024. The new 2000 MLD water treatment plant is expected to be completed by February 2028.

2. Recycle & Reuse of Wastewater to potable water at Colaba WwTF :

Brihanmumbai Municipal Corporation is exploring various possibilities for augmenting Mumbai's Water Supply by non-conventional methods to tide over the current demand- supply deficit and providing sustainable alternative to the same. Considering this, it is proposed to carry out 12 MLD

pilot project for conversion of Wastewater to potable water at the Colaba Wastewater Treatment facility having capacity of 37 MLD. Project Management Consultant is appointed for 12 MLD Advance Tertiary Treatment Plant at Colaba and consultant have submitted feasibility report in February 2024.

3. Front End Engineering Design, preparation of Draft Tender and Bid

phase assistance for constructing new Tulsi Water Treatment Plant :Tender has been invited for the work of "Consultancy Services for Detailed Survey, Front End Engineering Design, preparation of Draft Tender and Bid phase assistance for constructing new Tulsi Water Treatment Plant".

4. Development of Renewable Hybrid Energy Project Facilities of Hydro

Electric Power Plant and Floating Solar PV Power Project at " Hinduhridaysamrat Shivsenapramukh Balasaheb Thackeray Middle Vaitarna Dam " : The work is awarded to M/s Shapoorji Pallonji Company Private Ltd. - M/s Mahalaxmi Konal Urja Private Ltd. (JV) (SPCPL – MKUPL (JV). BMC has entered into Power Procurement Agreement (PPA) with M/s Vaitarna Solar- Hydro PowerGenco Pvt. Ltd. (M/s VSHPPL), a SPV formed by Concessionaire M/s SPCPL-MKUPL (JV). Currently activities related to financial closure are being carried out by concessionaire.

5. 60 MLD Water Reclamation Plant in Panjrapur Complex:

The Water Reclamation Plant Panjrapur has been commissioned in the Month of October 2023. The plant is in 24 x 7 operations successfully from 01.11.2023 and reclaiming around 35 to 40 MLD of Water.

6. Transfer of Excess Water from Vehar Lake to inlet bay of WTP at Bhandup Complex :

During monsoon, in case, the high tide in sea is accompanied by heavy rains and also the overflow of vehar lake is discharged in Mithi River and may result in flooding of river especially during heavy monsoon which may result in loss of property etc. and flood like situation may arise in the said river. To provide relief, it is proposed to construct a pumping station to pump the overflow of Vehar lake to inlet bay of Bhandup Complex Water treatment plant during heavy monsoon. The Letter of Acceptance is issued to the contractor in March 2024.

7. Consultancy Service for carrying out Condition Analysis and Structural Audit of Existing Weir and detailed Engineering of New Pick Up Weir at Pise (Bhiwandi):

The Consultant has submitted Inception Report of the Work. The work of Structural Audit of existing Weir is completed. Hydrological Survey vetting work is completed. Further approval from C.D.O. Nashik awaited. After receipt of remark from C.D.O. further action will be taken.

8. Providing Consultancy Services for construction of new Chlorine Contact Tank at Panjarapur Water Treatment Plant, Panjarapur, Tal. Bhiwandi, Dist. Thane:

The inception report and final feasibility report is submitted by consultant and further approval with respect to the report is in process.

9. Upgradation of Powai Lakefront :

Aerator fountain installation is completed at Powai lake. Operation and maintenance activities are in progress.

10. Consultancy services for feasibility study of integrating potable water (produced from seven Waste Water Treatment facilities) with water supply system of Mumbai city :

Most of the part of the water supplied to Mumbai city is converted into the waste water which is further proposed to be treated upto tertiary level and thereafter released in Arabian Sea. For which the work of tertiary treatment of water from 7 WWTF has been initiated by Sewerage Project department of BMC.In continuation with this, it is proposed to determine feasibility of ways to integrate this water into existing distribution system after futher treatment to potable standards. Letter of acceptance is issued in February 2024 to the consultant for the work of Consultancy services for feasibility study by Water Supply project department.

Proposed / Ongoing Projects of Tunnels in support for Improvement in Water Conveyance system:

1. Proposed Tunnel Yewai Master Balancing Reservior to Kasheli :

Mumbai gets 2000 MLD water from Bhatsa Basin out of which about 1400 MLD water is treated at the Panjrapur Water Treatment Plant and the treated water at Panjrapur is further conveyed to Mumbai from Yewai MBR through two water mains, Mumbai-II and Mumbai-III and remaining 600 MLD raw water is injected into the Vaitarna / Upper Vaitarna main at Yewai & further conveyed to the Bhandup complex for treatment process. Due to widening of Mumbai Nashik Highway and from water security point of view an alternative to existing surface water pipelines need to be provided. It is therefore proposed to construct water conveyance Tunnel from Yewai to Kasheli with enhanced capacity. The consultant have been appointed. Tender for the work has been invited in March 2024.

2. Proposed Tunnel from Kasheli to Mulund : 7.13 Km

BMC's Mumbai-II and Mumbai-III water supply mains are aligned along Eastern Express Highway (EEH) and cross Thane city before entering Mumbai limits at Mulund. Due to all-round growth of Thane city & proposed development thereat and owing to the request received from Thane Municipal Corporation, Brihanmumbai Municipal Corporation (BMC) has proposed to construct a water supply tunnel of 7.13 KM from Kasheli (Bhiwandi) to Mulund Octroi Naka (Mumbai) as an alternative arrangement to the above said water mains.The consultant have been appointed. Tender for the work has been invited in March 2024.

3. Construction of tunnel from Powai to Ghatkopar High Level Reservoir and further upto Ghatkopar Low Level Reservoir (Remaining Work) :

LoA is issued to the contractor on 12.04.2022 and the letter of commencement is issued to the contractor M/s.Patel Engineering Ltd. on 02.12.2022. Presently the work of construction of the shaft including Assembly & Tail tunnel by controlled blasting method is completed at SCI (Shipping Corporation of India at Powai). The physical progress of the work is 7%.

4. Construction of tunnel from Hedgewar Udyan to Trombay Low Level Reservoir, Further upto Trombay High Level Reservoir

As on March 2024, 85% of physical progress of work is completed and balance work is in progress.

5. Amar Mahal-Wadala-Parel tunnel (2.5 mtrs dia, 9.7 kms length):

The first stretch of 4.2 Km of tunnel boring and subsequent tunnel lining from Amar Mahal (Chembur) to Pratiksha Nagar near Wadala has been completed in August 2022. The boring of second stretch i.e. from Wadala to Parel is in progress and as of date boring of approx 1 km length is balance. The overall progress of the project is 70% and is expected to be completed by April

2026. After completion of this work it is expected to improve the water supply of 'F/North', 'F/South' & part of 'E' & 'L' Wards and will also cater to the requirement of future development at BPT(Bombay Port Trust) land & Wadala Truck Terminus areas. Pipelines:

Pipelines Work

1. Replacement of old TwinTansa Mains (1450mm dia. each) by providing and laying Single 2000mm dia. M.S. pipeline from Maroshi to Sahar Village: Removal of Twin Tansa mains is in progress. Pipe Fabrication work is in progress.
2. Supply, installation, testing, commissioning of Flow meters and improvement in existing SCADA with allied civil works.

The new SCADA System's Site Acceptance Test (SAT) is conducted in June 2023 and after commissioning, the O&M of the system is started from September 2023. 55 nos. out of total 62 nos. four path flow meters having accuracy of ± 0.5 % are installed on bulk water lines which will aid in water audit and thereby managing the city's water supply more effectively.

Structural repairs to existing Reservoirs:

1. **Structural repairs to Trombay High Level Reservoir(THLR) located inside BARC premises Anushaktinagar :** - Work has been completed in June - 2023.
2. **Structural repairs to Trombay Low Level Reservoir, RCF Colony,Chembur:** Work has been

completed in April - 2023.

3. **Structural Repairs to Ghatkopar Low level Reservoir in 'N' ward:** 25% Work is completed. Expected Completion by November – 2025.

4. **Structural Repairs to Powai Low level Reservoir in S ward:** 15% Work is completed. Expected Completion by March – 2025.

5. **Structural Repairs to Powai High Level Reservoir -II in S ward:** The work will be started after the completion and handing over of Powai Low Level Reservoir to H.E. Department. Expected Completion by May – 2027.

6. **Structural Repairs to Bhandup Master Balancing Reservoir (MBR-1) at Bhandup Complex :** 72 % Work is completed. Expected Completion by July- 2024.

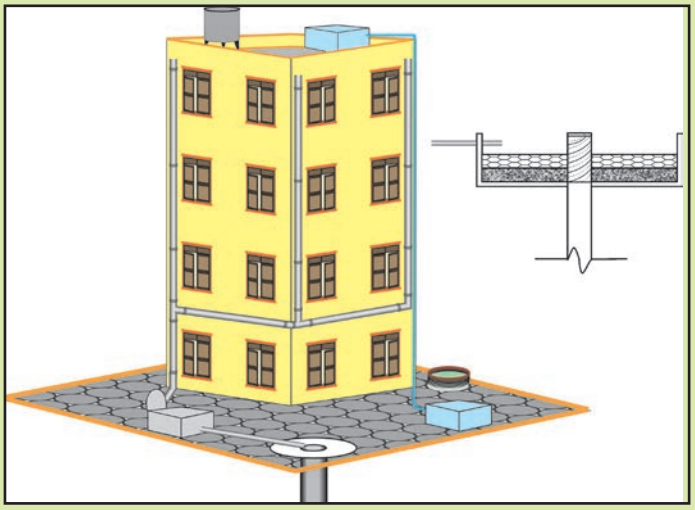
7. **Structural Repairs to MBR, Yewai , Panjrapur :** 46% Work is completed. Expected Completion by September - 2024.

Reconstuction of Existing Reservoirs :

Reconstuction of Malbar Hill Reservoir at Phirozshah Mehta Garden Malbar Hill in 'D' Ward : The work of Reconstruction of Malbar Hill Reservoir has been initiated.

10. RAIN WATER HARVESTING

Brihanmumbai Municipal Corporation Supplies 3975 million liters of water every day, againts a demand of 4505 million liters per day to Mumbai, the economic capital of our county. The purity of the water supplied to the citizens of Mumbai is very high on the “International Quality Sandards Rating” & considerable expenditure is incurred for this purification.Unfortunately this water is bing used for all secondary requirements alos such as flushing of latrines and washing of vehicles. In view of the indiscriminately rising population and comparatively limited resources there is an urgent need to search ways to save water and to put those to actual use. BMC may not be able to supply water for secondary requirements such as flushing, gardening, vehuicle washing swimming pools, air conditioning etc. & it is expected that Citizen have to generate the water for secondary reqirements through rain water harvsting or recycling.



Rain water Harvesting (RWH) is an ancient and convenient method. It implies storage of rainwater i manmade tanks or recharging ground water and utilization as per requirement. Since, rainwater whthin our own compound is to be stored; anybody is entitled to do so. Most importantly, the capital expenditure and maintenance cost involved in this method is quite low. Rain Water Harvesting contributes in raising the ground waterlevel, the quality of the ground water improves & Soil ersion is arrested. Entry of seawater in ground water can be prevented.

Following methods can be deployed for Rain Water Harvesting.

1. Storage in underground or above ground artificial tanks.
2. Direct reacharging of the subsoil water strata (aquifer) through dug up wells or bore wells.
3. Rechatging of the subsoil water by percolation.
4. Forcing rainwater in the ground through bore wells and thereby preventihg entry of salty seawater in the subsoil strata.
5. Very larg quantites of water can be stored because of the large roof areas of industrial buildings. Those who buy water in tankers can save on this expenses by using rainwater. House owners or tenants can store rainwater with a little bito of efforts. BMCis making all-out efforts to actually practice rain Water Harvesting / water conservation.

Municipal Corporation of Greater Mumbai is the 1st Municipal Corporation in maharashtra to make Rain Water Harvesting mandatory. Rain Water Harvesting had been made mandatory to new propertiescoming for developments from 1st Oct. 2002 having plot 1000 sq. Mtand more. This condition was extended to the properties which had come for development prior to 1st Oct. 2002 but are coming for occupation / completion from 1.9.2003.

As per Government directives u/on. TPB – 4307/396/CR/2007/UD – 11 dtd. 6.6.2007, the condition was binding to all developments having plot area 300 Sq. Mts. & more. Froen8.05.2019 as per DP 2034, the condition is binding to all developments having plot area 500 Sq. Mts. & more. The condition is applicable to the properties coming for addition alterantion /use of balance FSI etc. The condition is imposed as of the I.O.D. (Intimation of Disapproval) conditions for insatallation of RWH scheme and occupation certificate is granted only after compliance of the same. RWH scheme is being desingend by the RWH consultant appointed by the Architect. The completion certificate for the implemented scheme is also being issued by the RWH Consulatant. Buliding Proposal dept. Verifies the completion certifdicate issued by the Consultant before issusing Occupation Certificate. RWH is being implemented in all the new developments of Municipal Corporation where RWH is mandatory. In addition all the DepartmentalHeads of BMC have already been direcated to get RWH schemes implemented in their premises. To encourage existing privated Co-op Housing Societoes / Owners to implement RWH schemes in their premise Rain Water Harvesting & Water Conservation call of BMC guides regarding implementation of RWH schemes free of cost. In addition BMC while issusing new Bore well permissions in privat premises, a condition is incorporated to recharge such bore well with roof top rain water.

The call organized first 2 days technical seminar with All India Institute of Local self Govermrnt (A.I.I.L.S.G.) and Indian Water Works Association (I.W.W.A.) ON 28th Feb. / 1st Mar. 2003. The seminar comprised of 17 lectures & 130 participants were appraised of various aspect of rain water harvesting. The RWH cell had participated in most of the major seminars in mumbai & conducted many awereness programs to appraise various section of society. To involve citizen essay competition on "my way of water conservation" was organized in july 2003 in four groups and four languages. An information booklet on rain water harvesting & water conservation was released in its prize distibution ceremony by hon. Mayor of mumbai. The booklet is appreciated even by government of maharashtra and circulated to many municipal corporation / councils. Municipal calendar 2004 was dedicated to rain water harvesting so

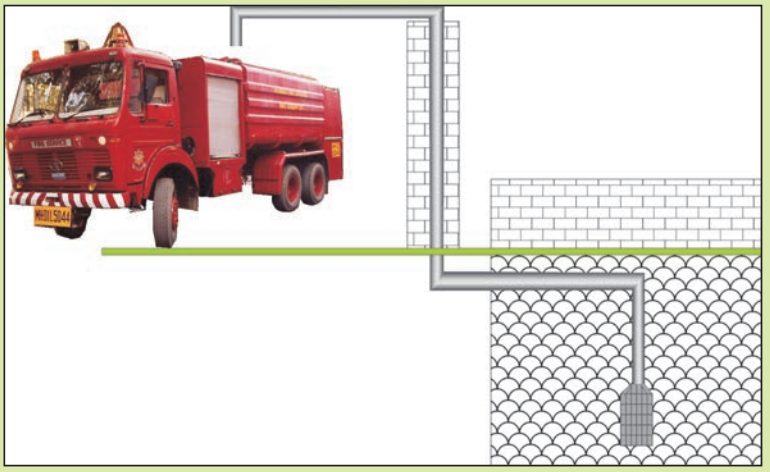
that the message is conveyed to people at large. Drawing competition for municipal school children was also conducted in jan / feb. 2004 to create awareness amoungst teachers, students and their parents N.S.S students were involved in awereness campaigns to reach more citizens. Techniques like jalmelas in each administrative ward and open grounds. Training ward staff for dispersing basic information, paiting BEST buses relaying messages through TV sets on railway stations in BEST buses and private premises putting message on municipal bills advertisement hoardings at prominent locations, informative documentaries in CST subway are being adopted to reach masses. N.G.Os are also involved in this activity. Media like TV channels and FM radios are also being used for communication messages. The all requisite information is also uploaded on website www.mcgm.gov.in for easy access by citizen. As a part of awareness campaign, in 2012 , BMC has published a school book series in marathi titled on water conservation and rain water harvesting for std 1 to 10. moreover another activity titled ' Aji Ajobanche bol' had been introduced to rope in senior citizen in this campaign. It is expected that senior citizen would use their energy in convincing people in their nearby locality to save water. They would also interact with school children and even read out books to them and explain the ideas incorporared thereat.

In view of the late monsoon in the year 2015, (RWH & Wat. Cons.) Cell has started Save Water Awareness Campaign to spread awareness amongst the citizens of Mumbai. As a part of the continuous awareness campaign, advertisements in local newspapers were published appealing Mumbaikars to use water, judiciously and to avoid wastage of water. Save water awareness posters, short videos were prepared with the help of Tata Trust. Save Water appeals / advertisemets were also displayed on BEST buses, Bus Queue shelters, TV in BEST buses & in local trains. Lectures on water conservatin in various Municipal school via virtual classroom were delivered through Marathi Vidnyan Parishad. A yearlong initiatives 'Water smart Mumbaikars – mass awareness for water conservation" has been initiated by me 2 green NGO as BMC as concept partner.

Due to late monsoon in 2019, with the help of Public Relation Dept., Hydraulic Engineer's dept. Printed 1,92,000 Save water awareness posters in Marathi, English & Hindi appealing Mumbaikars to use water judiciously and to avoid wastage of water. These posters were pasted in all the Municipal officer & some of the private premises all across Mumbai.

Jal Shakti Abhiyan : Catch the Rain 2022

Central Government had launched a nationwide campaign "Jal Shakti Abhiyan: Catch the Rain 2022"- when it falls where it falls, focusing on saving & conserving rain water, covering both Urban & Rural Areas across the country. Hon'ble President Shri. Ramnathkovind inaugurated the Jal Shakti Abhiyan on 29.03.2022. The staff of Hydraulic Engineer Department of BMC had been participated in this event through Facebook Live and took the water oath as per the guidelines of National Water Mission.



Under Jal Shakti Abhiyan Catch the Rain 2022, Rain Water Harvesting Cell of BMC has implemented Awareness Campaign consisting of an exhibition of posters, advertisements in local daily Newspapers, display of banners etc. And save water messages published through local daily newspapers in Marathi, Hindi, English & Urdu Languageson every Sunday from the month of May 2022 to August 2022. Save Water Digital Posters & flex banners has displayed in all the 24 BMC Wards Officer, Municipal Hospitals, Offices, CFCs centers etc.

Save water awareness campaign-2024

Due to less rainfall last year in catchment area of dams, the available water stock in the dams is less as compare to last two years. Hence, it is necessary to create awareness among the citizens of Mumbai to avoid wastage of water. As a part of awareness campaign it is decided to distribute and display the Save Water Awareness posters in 24 wards of BMC, to publish advertisement in local daily newspaper, to broadcast audio clip though FM radio and to display save water messages on BMC portal.

BMC takes efforts in all directions to support Rain Water Harvesting which is one of the Best management practices for a Corporation. It is the duty of all citizens to contribute their own efforts to this cause to help themselves.

11. SEWAGE DISPOSAL

Sewerage disposal work is carried out by three departments of Brihanmumbai Municipal Corporation in following ways:

1. **Sewage Operation (SO):** It Operates and maintains Municipal sewage systems comprising of conveyance systems i.e. sewer lines, collection system i.e. Sewage Pumping Stations and Sewage Treatment Facility and disposal system.

2. **Sewage Projects (SP**): This department looks after the work of sewer planning, laying of new sewers, up-sizing the existing sewers and elimination of missing links in existing sewer network.

3. **Mumbai Sewerage Disposal Project (MSDP):** This department carries out the work of construction of Waste water Treatment Facilities and Pumping Stations for treatment and disposal of sewage. It also carries out works of construction of sewer tunnels.

Brihanmumbai Municipal Corporation has prepared second sewerage master plan known as Mumbai Sewage Disposal Project (Stage II) in the year 2002. In order to provide safe and clean environment to citizens various projects such as Upgradation of existing Waste Water Treatment Facility (WwTFs), Construction of new WwTFs, Reconstruction of Sewage Pumping Station, construction of Sewer Tunnels are planned.

The projects of WwTFs are undertaken as per effluent discharge standard prescribed by Hon'ble NGT in their order dated 30.04.2020 (BOD<10 mg/Ltr, TSS<20 mg/Ltr, Fecal Colliform<100 MPN/100 ml).

Table No. 11.1: The details of the WwTFs projects

Sr. No.	Name of WwTF	Plant capacity in MLD	Tertiary Treatment(Capacity in MLD for Reuse)	Design,Build Period in years	Expected date of Completion
1	Worli	500	250	5	04.07.2027
2	Bandra	360	180	5	04.07.2027
3	Dharavi	418	209	5	04.07.2027
4	Versova	180	90	4	04.07.2026
5	Malad	454	227	6	04.07.2028
6	Bhandup	215	108	4	22.08.2026
7	Ghatkopar	337	170	4	04.07.2026
	Total	**2464**	**1234**	-	-

The tenders for WwTFs at Worli, Bandra, Dharavi, Versova, Malad, Bhandup and Ghatkopar were invited on Design Build Operate (DBO) basis in which operation and maintenance of 15 years are included. All the STP works are awarded to successful contractors. STP works for Worli, Bandra, Dharavi, Varsova, Malad and Ghatkoper have commenced from 05.07.2022 and work for Bhandup STP has commenced from 23.08.2022.

The work of 37 MLD Colaba WwTF has been completed and same has been put in operation from April 2020.

Brihanmumbai Municipal Corporation has emphasized the need of recycle and reuse of treated waste water for non potable and industrial purposes.

There is a provision of 50% of plant capacity for tertiary treatment in WwTF. This tertiary treated water will be made available for non potable purposes. At present 10 MLD of treated waste water is available at Colaba WwTF for reuse. After completion of these seven STPs in Mumbai, not only 2464 MLD of sewage water will be recycled but also the much concerning issue of environmental preservation and degradation will get addressed.

List of other work being carried out by this department along with their present status is as below:

Table No. 11.2: Works of construction of some tunnels in progress

Sr. No.	Name of the Tunnel	Size of Tunnel in mm	Length of Tunnel in Km	Remarks
1	Versova: From D.N. Nagar old Versova Pumping station To new Versova Influent Pumping station (near Versova Lagoon)	2000	3.1	Work in progress. Tunnel Boring completed. Physical Progress = 97%
2	Priority Sewer Tunnel-I: From Don Bosco school, Borivali (West) To New Malad IPS.	3200	5.8	Work in progress. Physical Progress = 40%
3	Priority Sewer Tunnel-II : From Goregaon Pumping Station To new Malad IPS	2600	4.7	Work in progress. Physical Progress = 11%
4	Mithi-IV: Construction of Sewer Tunnel From Bapat Nallah and Safed Pul Nallah To Dharavi WwTF	2600	6.7	Work in progress. Physical Progress = 69%

Table No. 11.3 : The Capacity of the Pumping Stations

Sr. No.	Sewage Pumping Station	Plant Capacity in MLD	Remarks
1	Varsova IPS	540	Work in progress (73%)
2	Malad IPS	1580	Work in progress (55%)
3	Bhandup IPS	461	Work in progress (66%)
4	Ghatkopar IPS	699	Work in progress (12.5%)

The benefits of various MSDP - II projects to the environment are as follows:

1. Saving and Conservation of Drinking Water
2. Conservation of Environment
3. Improvement in Public Health of Mumbai City
4. Improvement in Sea aquatic Life & water quality.

Sewage Operation (SO):

Laboratory at Dadar under Sewerage Operation department has carried out monitoring of marine outfalls at Worli and Bandra. Marine water samples are collected at 1km. peripheral area from outfall disposal point.

Table No. 11.4: Water Quality at Marine Outfall 2023-24

Sr. No.	Place	PH		D.O. (mg/l)		Turbidity (in NTU)		F-Coli (CFU)		B.O.D. (mg/l)	
	Standard: SW-II	6.5-8.5		≥ 4 mg/l		≤ 30 NTU		≤ 100/100 ml		≤ 3 mg/l	
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
1	Worli Outfall	7.06	8.27	5.4	7.9	1.55	4.48	70	295	0.4	2.4
2	Bandra Outfall	7.11	8.35	6.4	8.8	1.47	5.25	50	370	0.9	2.8

D.O.: Dissolved Oxygen B.O.D.: Biochemical Oxygen Demand CFU: Colony Forming Unit
Source: This information is received from Sewerage Operation Department Dadar Laboratory.

The analytical reports are compared with the MPCB standards - SW II and it has been found that at Worli and Bandra, levels of pH, D.O., Turbidity are within the prescribed standards and max. level of F. Coli are exceeding at all sites. At Worli, max. level of B.O.D. exceed than standards.

Table No. 11.5: Zone wise capacity and average dry weather flow capacity of sewage

Sr. No.	Name of Sewage Treatment Plant	Installed Capacity (In MLD)	Zonewise Avearage Dry Weather Flow Capacity of sewage (In MLD)
1	Colaba	37	32.71
2	Worli	757	313.01
3	Bandra	797	622.64
4	Versova	180	99.71
5	Malad	280	187.01
6	Bhandup	280	115.24
7	Ghatkopar	386	92
8	Charkop	6	4.53

M.L.D.: Milion Liters Per Day
Source: This information is received from Sewerage Operation Department Dadar Laboratory.

12. STORM WATER DRAINS

Mumbai is liend on the west by Arabian Sea and intercepted by number of creeks. The tidal variation is a major concern in the system of strom water drains (SWD) to release rainwater as well as wastewater into sea. The present SWD system in the Mumbai city area has Major nalla of approx. 274 Kms, Minor Nallla and Road side driain of 637 km and 2181 km respectively long and existing since 100 years. This network consists of underground drains,laterals and water entrances built on the basis of area and weather conditions. The old SWD system is capable of handling rain intensity of 25 mm per hours at low with runoff cofficent of 0.50.If the rain intensity exceeds 25 mm per hour during high tide, is always possibility of water logging in low lying areaso of the city.

In practice however, in addition to strom water, they aloso crry sewage overflow from septic tank, surface water, ect. The flow from the open SWD is discharged either into nallhas, culvert, creek or sea. This open SWD becomes an eyesore due to throwing of garbage by citizens

especially in slum area and creats unhygienic conditions. Therefore, desilting is carrind out through registered contractual agencies througout the year. Due to existing inadequate Sewerage System the sewage is transported through road side open drain, underground Storm Water Drain. Consultant has suggested to prevent the sewage transportation through SWD network. Under JNNURM Sewerage project Department has undertaken plan to separate the sewage flowing through SWD network.

There are 82 major out-falls in the area which drain to Arabain sea directly, also 9 at Mahim creek, 7 at mahul creek , and 7 at Thane creek. There are 51 out-falls in western suburbs creek. In eastern suburbs, 25 out-falls discharge in Thane creek, while 4 discharge in Mahul creek. In suburbs and extended suburbs area, open SWD are constructed on both side of road.

Heavy rain in Mumbai city in june 1985 had resulted into flood like situation, which paralyzed the roads and railway traffic and there was heavy economic loss. In view of this, corporation dicided to carry out thr study of the strom water drainage system in the city. A master project was planned to help to drain out strom Water immediately and reduce floods. In the year 1989 M/s Watson Hawksley International Pvt. Ltd. And their Indian sister concern M/sAIC was appointed as a consultant for this project. The consultants had inspected existing strom water drainage system and maintenance. They have also studied the preparation of map and its scale again. In year 1993, to improve the strom

water drainage system, they prepared a master plan, which is known as BRIMSTOWAD Master Plan. This plan suggested improvments in SWD system with desing criteria, of rainfall intensity of 50 mm/ hr with runoff coeffcient of 1.00

The government of india sanctioned a special grant of Rs. 1200 crores as per detailed project report submitted to Government of india to implement BRIMSTOWAD Project in year 2007. Out of these, BMC has received Rs. 1000 crores till date.

Subsequntly in the yesr 2005 Mumbai faced unprecedented rains on 26th and 27th july 2005 and 944 mm rainfall was recorded in one day. This resulted in the flooding; therefore, Goverment of Maharashtra had appointed a fact Finding Committee to analyze the factors responsible for the situation that arose during July 26th and 27th , 2005 in mumbai and find out the temedial measures therea so as to avoid such incident in future. Based on the BRIMSTOWAD Master Plan Report and recommendations of Fact Finding Committee, the balance BRIMSTOWAD warks for the improvement to the storm water drain system are undertaken. As per suggestion of the face finding Committee BRIMSTOWAD report is to be reviewed and upgraded for which BMC has appointed M/s. MWH (I) Pvt. Ltd, as the consultant, The master plan is finalized by the consultant and same is submitted on 30.04.2018.

Brimstowad project is proposed to be implemented in two phases. There are 20 works in Phase-I and 38 work in Phase-II. The scope of the BRIMSTOWAD project is as under-

1. Rrhabilitation and augmentation of underground drains in city
2. Construction of new drains in RCC
3. Training of nallas in RCC M-40
4. Widening and Deepening of nallas.
5. Consteucation of access road along the nalla
6. Construction of Strom Water Pumping Stations.

Table No.12.1: Present status of the BRIMSTOWAD Projection

Details	Phase I				Phase II			
	City	W.S.	E.S.	Total	City	W.S.	E.S.	Total
Name of the Works	5	7	8	20	16	10	12	38
No. of completed works	5	7	7	19	14	5	7	26
No. of the works in progress	0	0	1	1	1	3	4	8
Tenders yet to be invited/ Tenders invited	0	0	0	0	1	2	1	4

Source: Storm Water Drain Dept of BMC

Table No.12.2: Status of Strom Water Pumping Stations under BRIMSTOWAD		
Sr. No.	Pumping Station	Status
1	Haji Ali	Completed and commissioned in May 2011
2	Irla	Completed and commissioned in May 2011
3	Cleaveland	Completed and commissioned in May 2015
4	Lovegrove	Completed and commissioned in May 2015
5	Britannia	Completed and commissioned in June 2016
6	Gazdarbund	Completed and commissioned in June 2019
7	Mogra	Contractor Appointed.
8	Mahul	Tender Invited.

Source: Storm Water Drain Dept of BMC

Total expenditure incurred till April 2023 is approx Rs.2541.37 Crores. However, due to increased width and depth of the drains due to change in design parameters, requirement of unconventional technology specially in tidal zone and passage of time – particularly due to encroachment issues, total financial requirement of the project has seen a substantial rise and additional funds to the extent of Rs.2700 Crores are required.

Environmental Aspect:

As regards cleaning and desiliting of nallas, the same is carried out every year, prior to monsoon within BMC jurisdiction.The same are cleaned by specially appointed. The work of desiliting is carried out in phases. About 75% of the work is carried out before monsson. 15% during monsoon and balance 10% post monnsoon. Further, silt from all the water inlets are also removed.

The desiliting of the underground strom water drains is carried out deploying sufficient machineries such as fierx, suction, Recycling machine, jetting, suction cum jetting machine in deep chambers, where man entries are prohibited. The road side desilted by means of rodding and dredgers. JCB, poclain, pantoon mounted poclain, machineries are engaged for desilting of major nallas in suburbs.

Brihanmumbai Municipal Corporation has undertaken rejuvenation work of Dahisar, Poisar and Oshiwara River. Work of rejuvenation of Dahisar, Poiser and Oshiwara River is in progress.

The rejuvenation work includes widening of river, improvisation of quality of river water, preventing contamination of rivers caused form river catchment area, network of sewage disposal line, construction of service road for sewage water process stations, beautification of river bays/ sides and installation of sewage water process stations etc.

Development of Mithi River:

Govt. Of Maharashtra vide GR No. MRD-3305/C.N.- 109/UD-7 dtd.19.08.205 has formed " Mithi

River Development and Protection Authority" under the Chairmanship of Hon'ble Chief Minister of Maharashtra State for the effective implementation of mithi River Development project. As per the said Goverment Resolution, out of total river length of 17 km, the development works for 11 km length (between Filtarpada, Powai and CST Brige, Kurla) have been carried out by Brihanmumbai Mahanagarpalika (BMC), whereas, the development works for remaning 6 km length (between CST Bridge, kurla and mahim Causeway) have been carried out by Mumbai Metropolitan Region Development Authority (MMRDA). In BMC's jurisdiction part of Mithi River, widening and deepening work is almost completed except the stretch between Kurla-Kalina Bridge and CST Bridge.

Till date, 92% of widening & deepining work and 935% construction of retainig wall work have been completed for 17 km long Mithi River, as result two times the holding capacity and three times the carrying capacity of river has been increased. In order to contrel the pollution problem of Mithi River, Mithi River Pollution Control plan has prepared. The said plan is being carried out in 4 packages, between Filtarpada, Powai and Mahim CausewayGovernment of Maharashtra has formed 'Mithi River Development and Protection Authority' under the Chairmanship of Honorable Chief Minister of Maharashtra State on 19th August 2005 for improvement of the Mithi River. Out of the total length of Mithi River 11.00 kms of Mithi River, 6.00 kms. is under jurisdiction of MMRDA. In BMC jurisdiction part of Mithi River, widening and deepening work is almost completed except the stretch between Kurla-Kalina Brige to CST Bridge at Kurla.

Till date work of deepening and widening of Mithi River is 95% completed and construction of Mithi River retaining wall has been 85% completed. Mithi River Development and Pollution Control plan has been prepared to control the flood and pollution problem of River. The same is being carried out in 4 packages between Filtarpada, Powai and Mahim Causeway.

13. SOLID WASTE MANAGEMENT

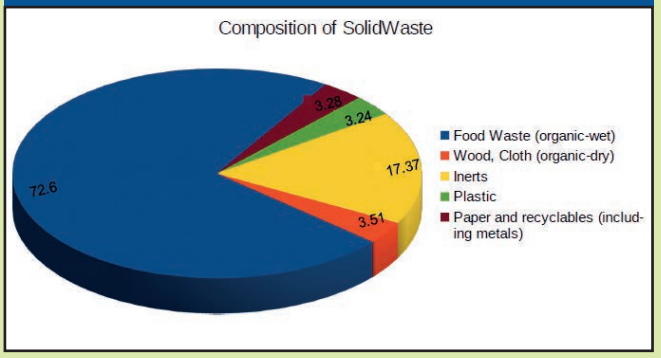
Due to various projects and programs arranged by Brihanmumbai Municipal Corporation in the last 5 years of the quantum of waste collected in the year 2022 has been approx 6300 MT per day. Of the 6300 MT transported to disposal sites by vehicles in over 921 trips/day, the waste is primarily collected separately as dry and wet waste. The waste can be broadly classified in various categories i.e. 72.60% Food waste (organic-wet), 3.51% wood, Cloth (organic-dry), 17.37% Sand, Stone and Fine earth, 3.24% Plastic, 3.28% Paper and recyclables (including metals).

Table 13.1: Composition Of Garbage In Mumbai

Sr. No.	Type of Solid Waste	Percentage
1	Food Waste (organic- wet)	72.6%
2	Wood, Cloth (organic-dry)	3.51%
3	Sand, Stone and Fine earth	17.37%
4	Plastic	3.24%
5	Paper and recyclables (including metals)	3.28%
	Total	**100.00%**

Source: Report of NEERI, 2016

Chart No. 13.1: Composition of SolidWaste



The waste from all over the city is collected and at present, it is treated at Kanjur processing site using Bio-Reactor Technology and Windrow Composting and rest is disposed off at the Deonar dumping site by simple dumping and leveling. Deonar dumping ground is the oldest one, receiving approximately 14% and Kanjur receiving remaining 86% of waste generated on daily basis. The activity of receiving of fresh MSW at Mulund Dumping Ground is stopped w.e.f. 21.12.2018 and the project work of recovering the land by processing the existing waste with suitable technology is in progress. Scientific Closure Project of old site at Gorai has been completed in 2009 and operation and maintenance of the site is in progress. Area of different dumping grounds is given in table 13.2. Input loads of MSW at various dumping sites are given in Table 13.3.

Table 13.2: Capacity of Various Disposal Sites in Mumbai

Disposal Site	Area (Ha) Filling	No. of Years in Use
Deonar	120	88
Mulund	24	47**
Kanjur	118.41	11

** - Receiving of fresh MSW at Mulund Dumping Ground is stopped w.e.f. 21.12.2018

Table 13.3: Input Load of Waste

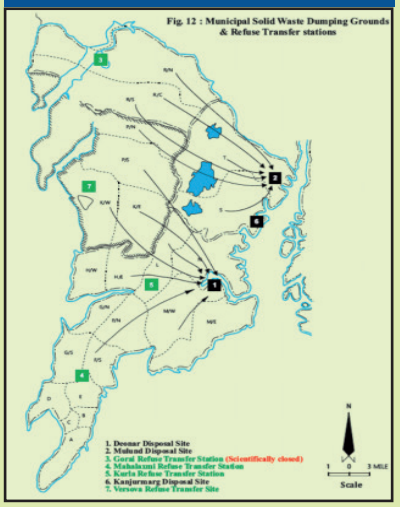
Sr. No.	Disposal Ground	Classification of Waste	Tonnes/day
1	Deonar	Municipal Solid Waste	Approx. 500-700 TPD
2	Mulund		The activity of receiving of fresh MSW at Mulund Dumping Ground is stopped w.e.f. 21.12.2018 and the project work of recovering the land by processing the existing waste with suitable technology is in progress.
3	Kanjur		Approx. 4500-5500

There are 2500 no. of 1.1-cubic meter containers, around 15,000 nos. of 120 Ltrs. Litter bins, around 10,000 nos. of 240 Ltrs. Litter bins and 100% of total waste is collected through House-to-House collection. The daily Municipal Solid Waste (MSW) is collected and transported by deploying various types of vehicles. Salient features of transportation are given in Table 13.4.

Table 13.4: Type of Transportation Vehicals For Solid Waste

Sr. No.	Type of Vehicle	Number of Services				
		2019-20	2020-21	2021-22	2022-23	2023-24
1	Compactors	1584	1432	1926	1547	1581
2	Skip Vehicles/ Dumper Placers	1	0	0	0	0
3	Dumpers/Refuse Vehicle	126	192	315	88	83
4	Bulk Refuse Carriers	-	-	-	-	-
5	Tempo/Jeeps	4092	3358	5294	4179	4238
6	JCB Machines	63	61	127	51	58
7	Stationary Compactors	80	83	97	97	95
	Total	**5946**	**5126**	**7759**	**5962**	**6055**

13.1



Swachh Bharat Abhiyan 2.0:

- Swachh Bharat Abhiyan 2.0 is launched on 1st October 2021 by the Hon'ble Prime Minister with vision of 'Garbage Free' cities.
- Since the Brihanmumbai Municipal Corporation is an important administrative mechanism for implementing Swachh Bharat Abhiyan, joint efforts are being made to maintain cleanliness in the city with the cooperation of the State and Central Governments.
- Under the said campaign, the efforts and programs of the Solid Waste Management Department of the Brihanmumbai Municipal Corporation have been revamped to achieve the required level of cleanliness.

- Swachh Bharat Abhiyan 2.0 period is from 1 October 2021 to 1 October 2026. The objective mainly include segregation of waste at household level, scientific treatment of old accumulated waste (legacy waste), Aspirational toilets, 100% sewage management – collection/ disposal/ processing etc.
- Rs. 1162 crore proposal under Swachh Bharat Abhiyan 2.0 has been approved for treatment of old accumulated waste (legacy waste) at Mulund and Deonar. In this, apartfrom the Municipal Corporation's share, the Central Government's Rs. 290.55 (25%) crores and State Government Rs. 406.77 (35%) Crores totalling Rs. 697.32 crore share will be received. Out of Rs.697.32 crore share , Rs.139 crore received & Rs.56.5 crores utilised for Mulund legacy waste binging.
- City Sanitation Action Plan of Mumbai is approved which will include 15000 community toilet seats, 400 Aspirational toilets for floating population, 4672 Individual Household latrine & 500 urinals in Mumbai under SBM 2.0

Cleanliness Fortnight:

- As per the directives of the Central Government various activities like 'Indian Swachhta League 2.0', 'Swachhata Suraksha Shibir' were undertaken from 17th September to 2nd October 2023. On September 17, 2023, a special beach cleaning program was conducted in Mumbai.
- On 1st October, people were encouraged to dedicate an hour to cleanliness in Mumbai from 10 am to 11 am in the program of "Ek Ghanta Ek Tariq". The program received huge response by bringing together around 39,000 participants on 178 locations and various government organizations, NGOs, resident organizations etc. The presence of dignitaries like Hon'ble Governor, Hon'ble Chief Minister, Hon'ble Deputy Chief Minister, Members of Parliament, Members of Legislative Assembly and eminent personalities graced the event. Their participation not only inspired the participants but also spread the message of cleanliness to the citizen's at large scale. The event organized by the Brihanmumbai Municipal Corporation, received huge support from the local community.
- Swachhata Suraksha Shibir' activities included training of sweepers, health screening camp sessions. On the occasion of Mahatma Gandhi's birth anniversary on 2nd October, programs like Prabhat Pheri, felicitation of sweepers, rangoli, pledge on cleanliness were undertaken.



Capacity Building :

♦ As per guidelines of Swachh Bharat Mission 2.0, ULB have to be create programmatic intervention for facilitating capacity building of municipal staff.

♦ Accordingly 250 Junior Overseers (J.O.)'s & Engineers working in ward sent to Indore to get overview of cleanliness model of cleanest city of India.

♦ These visits included waste collection/ segregation at source in residential areas, Centralized processing facilities & control room etc.

Solid Waste Management Rules, 2016:

On 8th April, 2016, the new SWM Rules 2016 issued by Ministry of Environment, Forest and Climate Change have come into effect and the said rules applies to the entire Country of India.

SWM Rules, 2016 also deals with the duty of manufacturers or brand owners of disposal products and sanitary napkins and diapers. Such manufacturers have been directed to provide necessary financial assistance to local authorities for establishment of Waste Management System. They have been also directed to put in place a system to collect back the packaging waste generated due to their production. In addition to the above, such manufacturers have been directed to explore the possibility of using all recyclable materials in their products and to educate masses for wrapping and disposal of their product.

In addition to the above, SWM Rules 2016 deals with the duties of waste generator. All resident welfare and market association Gated communities and institutions with more than 5000 sq. meter area, all hotels and restaurants, shall within one year from date of Notification of these rules and in partnership with local bodies, ensure segregation of waste at source by the generators as prescribed in this rule, facilitate collection of segregated waste in separate streams, handover recyclable materials to either the authorized waste picker or the authorized recyclers. The bio-degradable waste shall be processed, treated and disposed off through composting or bio-methanation within the premises as far as possible. The residual waste shall be given to the waste collectors or agency as directed by the local body.

SWM Rules 2016 provides for responsibility on the generation of the MSW by imposing penalty, if the same is not complied with in accordance with the Solid Waste Management Rules, 2016.

SWM Rules 2016 provides for the various compliances to be carried out by the Municipal Bodies within time frame mentioned therein.

The chart showing the various compliances to be carried out by Brihanmumbai Municipal Corporation alongwith the compliances already carried out and which are in process on behalf of the Brihanmumbai Municipal Corporation is as below.

Sr. No	Activity	Time limit from the date of notification of rules.	Action taken by MCGM
1	Identification of suitable sites for setting up solid waste processing facilities.	1 year	Already identified the land by BMC, in January 2015. Requested Govt. of Maharashtra to allot the land at Mauje Karvale, near Taloja to BMC for processing and disposal of Municipal Solid Waste (MSW) in compliance with SWM rules 2016. Also BMC has identified land at Mulund East (near Airoli bridge) and requested GoM to handover the same. As per Hon'ble High Court vide its order in PIL No.217 of 2009, Government of Maharashtra (GoM) has allotted about 52.10 Ha. land at village Karavale, Tal – Ambernath, Dist – Thane to BMC for Solid Waste Management Project. Out of this, 39.90 Ha. land is Government land and 12.20 Ha. is private land. Out of total 52.10 Ha. land, 35.82 Ha. lands is useful for the BMC (i.e. 29.715 Ha. Govt. land and 6.105 Ha. of private land) due to alignment of Alibaug Virar Corridor and the GAIL Pipeline passing through the designated plot. Out of 39.90 Ha. Govt. land Advance possession of Govt. land admeasuring 38.81 Ha. is given to BMC on 18.01.2016. The physical possession of Government land admeasuring about 12 Ha. has been taken over by BMC from Tahsildar Ambernath on 16.02.2019. Acquisition of remaining Govt. land and about 6.105 Ha. private land is being carried out through Collector Thane District. After completion of physical acquisition process, the land will be used for SWM Project activities of Brihanmumbai Municipal Corporation. Complied within the time stipulated.
2	Identification of suitable sites for setting up common regional sanitary landfill facilities for suitable clusters of local authorities under 0.5 million population and for setting up common regional sanitary landfill facilities or stand alone sanitary landfill facilities by all local authorities having a population of 0.5 million or more.	1 year	Same as above,
3	Procurement of suitable sites for setting up solid waste processing facility and sanitary landfill facilities.	2 years	Is in process. The Hon'ble Bombay High Court in order dtd. 02.11.2018 has directed Government to hand over the vacant possession of about 30 Acres out of the 52.10 ha. land at Village Karavale to Brihanmumbai Municipal Corporation on or before 31st January 2019. Out of the 52.10 ha. land 30 acres of Govt. land at Karavale has been handed over to Brihanmumbai Municipal Corporation on 16.02.2019 after rehabilitation of 8 PAP families by giving temporary accommodation of 500 Sq.ft. and compensation of Rs. 50,000/- to each PAP family residing on this 30 acres of land. Brihanmumbai Municipal Corporation has also deposited Rs. Rs.25,00,000/- on 12.06.2019 to state Govt. for acquisition process of private land at Karavale. Complied within the time stipulated.
4	Enforcing waste generators to practice segregation of bio degradable, recyclable, combustible, sanitary waste domestic hazardous and inert solid wastes at source.	2 years	Notices are already issued. Enforcement is being implemented in phased manner. Brihanmumbai Municipal Corporation has taken various initiatives for encouraging the segregation by bulk generator and the action against the defaulter has been taken. Brihanmumbai Municipal Corporation, against 1325 defaulting bulk generators has taken action under section 368 of MMC Act. Out of 1325 cases, in which prosecution was launched, and fine of Rs.42,93,500/- is recovered. Also under section 53 (1) of MRTP Act, out of 326 notices issued, in 44 cases prosecution is launched against non-compliance. Further, Brihanmumbai Municipal Corporation has identified 207 Bulk generators having area more than 20,000 Sq.M. and in 7 cases Maharashtra Pollution Control Board (MPCB) has launched prosecution. For collection and transportation of dry waste, Brihanmumbai Municipal Corporation has deployed 96 vehicles in 24 wards, which carry the dry waste to segregation centers. Brihanmumbai Municipal Corporation has implemented new zonal contract for collection of waste in line with SWM Rules 2016, in which 399 nos. of large compactors and 246 nos. of mini compactors vehicles having separate compartment for collection and transportation of dry waste, e-waste and wet waste are to be provided. Complied within the time stipulated.

Sr. No	Activity	Time limit from the date of notification of rules.	Action taken by MCGM
5	Ensure door to door collection of segregated waste and its transportation in covered vehicles to processing or disposal facilities.	2 years	Brihanmumbai Municipal Corporation has taken various initiatives thereby and has achieved almost 100% house to house collection, 86% segregation. Brihanmumbai Municipal Corporation has implemented new zonal contract for collection of waste line with SWM Rules 2016, in which 399 nos. of large compactors and 246 nos. of mini compactors vehicles having separate compartment for collection and transportation of dry waste, e-waste and wet waste are to be provided. Complied within the time stipulated.
6	Ensure separate storage, collection and transportation of construction and demolition wastes.	2 years	As of date, BMC collects and transports separately the construction and demolition waste. The BMC has planned to process scientifically 1200 TPD of C & D waste. The tendering process for Collection, Transportation, processing & Disposal of C&D Waste has been completed and Letter of Acceptance (LoA) has been issued to the contractors in Feb 2023. The project is expected to be commissioned by June-2024. As per the direction in Hon'ble Supreme Court of India in Special Leave Petition (Civil) no. 23708 of 2017, BMC has devised Special Software System to insure safe disposal of C&D generated by bulk generator complying with C&D Rules 2016. Also as regards to small scale C&D generators, BMC has 'debris on call' services. Complied within the time stipulated.
7	Setting up Solid waste precessing facilities by all local bodies having 100000 or more population.	2 years	Brihanmumbai Municipal Corporation has already setup Solid Waste Procesing facility at Kanjur Landfill site.The MSW processing facility has a capacity of processing 1000 TPD of MSW with composting technology and 3000 - 7200 TPD with bioreactor and compost technology for period of 25 years & has been operational since 13.12.2011. Presently, around 5900 TPD (4900 TPD by bio-reactor technology and 1000 TPD by compost) is being processed. Work of Waste to Energy Project is awarded. About 600 TPD MSW will be processed scientifically and about 7 MW energy will be generated from this project. Consent to Establish (CTE) has been received for the project on 04.06.2022from MPCB. Project is expected to be commissioned by dt.04.10.2025. In Process.
8	Setting up common or stand alone sanitary landfills by or for all local bodies having 0.5 million or more population of the disposal of only such residual wastes from the processing facilities as well as un-treatable inert wastes as permitted under the Rules.	3 years	At Kanjur site, there is provision of sanitary landfilling. There is provision at Deonar Dumping Ground in Waste to Energy project for sanitary landfilling. After getting possession of the land at Mauje Karavale, there is plan for setting up sanitary landfill site also at Mauje Karavale. In process
9	Bio-remediation or capping of old and abandoned dump sites.	5 years	The work of scientific closure of Dumping Ground at Gorai is completed in 2009 by BMC. Work of Dumpsite Reclamation at Mulund Dumping Ground (MDG) is awarded to the contractor. After obtaining required clearances and mobilization of equipments and machineries, commencement of the project is started from 01.10.2019. Till date (04.04.2024) contractor has scientifically processed and disposed off about 32,58,830 MT of legacy waste. M/s MITCON Consultancy & Engineering Services Ltd. has been appointed as Project Management Consultant (PMC) for this project. As regards to Deonar Dumping Ground, the existing dump thereat is about 20 million MT. The Hon'ble High Court, Mumbai vide Order dated 26th & 29th February 2016 directed BMC to engage the services of IIT or NEERI as consultants to suggest the measures for properly maintaining the site till proper facility is created thereon as per MSW Rules. Brihanmumbai Municipal Corporation has appointed IIT Mumbai initially as per the Order of Hon'ble High Court, Bombay. However, report submitted by IIT Mumbai was not found feasible as it was not complying the Order of Hon'ble High Court, Bombay. Thereafter, NEERI is in-principally appointed for closure plan at Deonar Dumping ground for the study to develop the closure plan for Deonar dumpsite, including advice on appropriate technologies to be used for the dumped waste at Deonar as per SWM Ruels 2016. Currently work has been awarded for carrying out legacy waste characterization study at Deonar Dumping Ground. Based on the outcome of the study further decision/planning shall be done Bio-remediation or capping of Deonar Dumping Ground. In process

New Projects for scientific processing of MSW:

Brihanmumbai Municipal Corporation has set up 46 dry waste collection and sorting centers in 24 wards. Other than these, Brihanmumbai Municipal Corporation has decided to set up 4 more dry waste collection and sorting centers and at some places work of setting up of additional dry waste centers is in progress. 94 Nos. of separate vehicles are deployed for collection and transportation of dry waste to dry waste sorting centers, in all the 24 wards of Brihanmumbai Municipal Corporation. Waste/ Rag Pickers' Associations are appointed to carry out the collection and segregation of dry waste. Dry Waste is segregated into paper, cardboard, thermacol, plastic, metal & glass and then sent to the recyclers for recycling directly by the rag pickers' associations.

Brihanmumbai Municipal Corporation framed its own Bye-laws in 2006, named as 'Brihanmumbai Mumbai Cleanliness and Sanitation Bye-laws'. These Bye-laws are applicable to every public place within the limits of Brihanmumbai Mumbai, to every generator of Municipal solid waste and to every premise under the ownership or occupation of any person within the limits of Brihanmumbai Municipal Corporation. Currently the byelaws are in process of modification to suit the requirement of SWM Rules, 2016.

Kanjur MSW Processing Site:

As per orders of Hon'ble High court and Hon. Supreme Court, the Government of Maharashtra handed over a plot admeasuring 141.77 hectares area at Kanjur to Brihanmumbai Municipal Corporation on 24.10.2005 for developing MSW disposal site. Out of said 141.77 Ha. area, mangroves area admeasuring 23.36 ha. was retained by the Government of Maharashtra vide notification dtd.02.04.2012.

Kanjur MSW Processing facility has received Environment Clearance from State Environment Impact Assessment Authority Maharashtra (SEIAA) on 05.12.2014 for 65.96 ha.

non CRZ area. Further, Kanjur MSW Processing facility has received Environment Clearance from State Environment Impact Assessment Authority Maharashtra (SEIAA) on 29.10.2018 for Scientific

processing of MSW in the balance 52.45 ha. of CRZ –III area. Renewed authorization from MPCB is received on Dt.23.08.2022. Accordingly total 118.41 ha. of land is available at Kanjur

MSW processing facility. At present, processing of about 4900 TPD of MSW with bioreactor technology and about 1000 TPD of MSW with windrow composting technology is being carried out at Kanjur MSW Processing facility..

New Projects for scientific processing of MSW:

Development of Waste to Energy (WTE) Project at Deonar:

Work of Waste to Energy project is awarded. About 600 TPD MSW will be processed scientifically and 4 MW energy will be generated from this project. Consent to Establish (CTE) has been received for the project on 04.06.2022 form MPCB. Project is expected to be commissioned by 04.10.2025.

Dumpsite Reclamation at Mulund Dumping Ground (MDG) in Mumbai by adopting suitable technology for existing waste dump:

Work of Dumpsite Reclamation at Mulund Dumping Ground (MDG) is awarded to the contractor. After obtaining required clearances and mobilization of equipments and machineries, commencement of the project is started from 01.10.2019. Till date (04.04.2024) contractor has scientifically processed and disposed off about 32,58,830 MT of legacy waste. M/s MITCON Consultancy & Engineering Services Ltd. has been appointed as Project Management Consultant (PMC) for this project.

Scientific processing and disposal of Waste at village Karavale, near Taloja:

As per Hon'ble High Court vide its order in PIL No.217 of 2009, Government of Maharashtra (GoM) has allotted about 52.10 Hectare land at village Karavale, Tal – Ambernath, Dist – Thane to BMC for Solid Waste Management Project. Out of this, 39.90 Hectare land is Government land and 12.20 Hectare is private land. Out of total 52.10 Hectare land, 35.82 Hectare lands is useful for the BMC (i.e. 29.715 Hectare Govt. land and 6.105 Hectare of private land) due to alignment of Alibaug Virar Corridor and the GAIL Pipeline passing through the designated plot. Out of 39.90 Hectare Govt. land Advance possession of Govt. land admeasuring 38.81 Hectare is given to BMC on 18.01.2016. The physical possession of Government land admeasuring about 12 Hectare has been taken over by BMC from Tahsildar Ambernath on 16.02.2019. Acquisition of remaining Govt. land and about 6.105 Hectare private land is being carried out through Collector Thane District. After completion of physical acquisition process, the land will be used for SWM Project activities of Brihanmumbai Municipal Corporation..

Scientific processing of waste at Mulund (E) Near Airoli Bridge:

The BMC has planned to process scientifically 1200 TPD of C & D waste. The tendering process for Collection, Transportation, processing & Disposal of C&D Waste has been completed and Letter of Acceptance (LoA) has been issued to the contractors in Feb 2023. The project is expected to be commissioned by June-2024.

Collection, Transportation, Processing and Disposal of Construction and Demolition (C and D) Waste in Mumbai:

Brihanmumbai Municipal Corporation has planned to process scientifically 1200 TPD C and D waste. The tendering process for Collection, Transportation, Processing and Disposal of C and D Waste has been completed and Letter of Acceptance (LoA) has been issued to the contractors in Feb. 2023. The project is expected to be commissioned by Feb. 2024.

Service Level Benchmarking:

1. To monitor the performance of any ULB regarding its Service Delivery to the Citizens, MoUD has devised benchmarks for each service delivered.
2. For Solid Waste Management Department there are 08 such benchmarks.
3. The benchmarks are elaborated below. (Current achieved values are mentioned in bracket)

Description of service	Target	Achieved
Coverage of SWM services through Door to Door collection	100%	100%
Efficiency of Collection	100%	100%
Extent of Segregation of Municipal Solid Waste	100%	86%
Extent of Municipal Solid Waste Recovered	80%	35%
Extent of Scientific Disposal of Waste at Landfill site	100%	88%
Efficiency in Redressing Customer Complaints	85%	94.93%
Extent of Cost Recovery in SWM Services	100%	100%
Efficiency in Collection of SWM Charges	90%	100%

Deep Cleaning Program :

The launch of the 'Deep Cleaning Program' in December 2023 addressed air pollution concerns by deploying machinery to clean major junctions and wash roads. Led by the Honourable Chief Minister, this comprehensive program focused on concentrated cleaning efforts in one area at a time, including repainting infrastructure, removing debris, and engaging the community. Response from citizens and active participation has created a mass movement. Till the end of March 2024 more than 32,000 citizens, NGO workers, students, BMC staff has contributed to Deep Cleaning Program. More than 3000 tons of debris, 500 tons of odd/ abandoned material and 1100 tons of garbage is cleared. More than 2880 machines, equipment's, water tankers, vehicles are used till date. The program's success is evident and has been replicated across the state of Maharashtra.

Bio-Medical Waste (Management and Handling) Rules, 2016:

Bio Medical Waste (Management and Handling) Rules, 2016 are notified by Ministry of Environment and Forest, Government of India, under Environment Protection Act 1986 vide Notification dated 28/03/2016. As per rules it is the duty of 'Occupier'/ 'Generator' to ensure that BMW is handled without any adverse effect to human health and environment by way of segregation, packing, transportation, storage, final treatment and disposal. An 'Occupier' is defined as an institutions like hospital, nursing home, clinic, dispensary, veterinary institution, animal house, pathological laboratory, blood bank etc. which generate BMW.

Brihanmumbai Municipal Corporation owns major hospitals, maternity homes, dispensaries and clinics. Brihanmumbai Municipal Corporation is therefore considered to be an 'Occupier' and is required to dispose of the BMW generated in these institutions as per BMW Rules 2016.

Moreover as per the BMW sub rule 6, it is not an obligatory duty of Brihanmumbai Municipal Corporation to collect and treat the BMW generated from private health care establishments.

However, as per amended BMW Rules 2016, sub Rule no.7, Municipal Corporations should provide suitable sites to private medical institutions for installation of common treatment facility without prejudice to the duty of 'Occupier'. Accordingly Brihanmumbai Municipal Corporation has provided suitable land at Deonar dumping ground for installation of bio-medical waste treatment plant for disposal of bio-medical waste generated in Mumbai jurisdiction.

The provisions under BMW Rules, states that the prescribed authority is Maharashtra Pollution Control Board and they are supervising the operation of the plant. An 'Authorization' to the plant operator of BMW treatment plant is issued by M.P.C.B. As per rule, it is also necessary to obtain an authorization from M.P.C.B. as a "Generator" who are generating the bio-medical waste.

As such, Brihanmumbai Municipal Corporation has installed integrated bio-medical waste treatment facility under the guidance of M.P.C.B. at Ghatkoper Mankhurd Link Road near Deonar dumping ground through M/s. SMS Envoclean (P) Ltd. The said facility has started its operation from May 2009. In all, M/s. SMS Envoclean (P) Ltd has put 46 nos. of specialized vehicles for collection of bio-medical waste from all health care establishments. Those Health Care Establishments who are registered with the BMW treatment facility are being provided the services of BMW collection and disposal by M/s. SMS Envoclean (P) Ltd. As of now 14000 nos. of health care establishments are registered with the centralized facility. Daily approx 20 M.T. of BMW is being collected and treated at Deonar BMW treatment facility.

E-Waste (Management) Rules 2016:

1. To avoid mixing of e-waste with municipal solid waste, Brihanmumbai Municipal Corporation has

proposed to appoint MPCB authorized e-waste recycling agency to set up e-waste collection centers in wards.

2. The work of setting up of e-waste collection centers can be given to MPCB authorized electronic producers/ e-waste collectors/ dismantlers/ recyclers.

Plastic Waste (Management) Rules, 2016:

Brihanmumbai Municipal Corporation has set up 46 dry waste collection and sorting centers for segregation of collected dry waste. The plastic waste is segregated from collected dry waste and is sent to the recyclers directly by the engaged waste pickers' association. Plastic shredding machines are installed at few DWSC locations in the city. Under EPR, companies like Bisleri and Coca Cola have set up plastic processing units across city.

The use and manufacturing of plastic carry bags below 50 microns is prohibited by law. The monitoring authority for the same is Maharashtra Pollution Control Board. SWM dept has developed banned plastic collection and storage facilities for the convenience of citizens. Use of media for spreading awareness about active public participation in minimizing use of banned plastic is being done. Around 336 MT of plastic waste has been collected since the ban has come into effect.

Hazardous Waste (Management, Handling and Transboundary Movement) Rules, 2016:

Hazardous Waste Management Rules are notified to ensure safe handling, generation, processing, treatment, package, storage, transportation, use reprocessing, collection, conversion, and offering for sale, destruction and disposal of Hazardous Waste. The Rules lay down corresponding duties of various authorities such as MoEF, CPCB, State/UT Govts., SPCBs/PCCs, DGFT, Port Authority and Custom Authority while State Pollution Control Boards/ Pollution Control Committees have been designated with wider responsibilities touching across almost every aspect of Hazardous wastes generation, handing and their disposal.

14. POWER SUPPLY AND CONSUMPTION

Bombay Electric Supply and Transport (BEST), an undertaking of Brihanmumbai Municipal Corporation, supplies electric supply to city area while Reliance Infrastructure Limited and Maharashtra State Electricity Distribution Company Limited (MSEDCL) supply to eastern and western suburbs. Tata Power Company Ltd. (TPC) supplies bulk power to some industrial units and railways.

Bombay Electric Supply and Transport (BEST):

BEST is the distribution licensee to supply electricity in the old city limits of Mumbai. It covers 72 sq.km. (area from Colaba to Sion and Mahim). In FY 2023-24 the maximum demand of Mumbai City was 946 MW and power purchased was around 4937 MU's. To meet this demand, power is purchased mainly from Tata Power Company (which also includes Hydro Power) and Manikaran Power Ltd. remaining power is purchased from bilateral sources, Power exchanges and environment friendly renewable source.

1) Steps forward for Energy Conservation :

Under the energy conservation initiatives, BEST has replaced 43500 HPSV / MH Street lamps by energy efficient LED lamps in the Mumbai City area. This has resulted in 47 % savings in electricity consumption.

2) Steps forward towards Pollution Control:

2.1) PM Surya ghar Yojna has been advertised by BEST on its website and various social medium platforms in order promote/pass on the benefits of using solar energy by installing Rooftop Solar (RTS) panels, to the electricity consumers. Also Rooftop Solar section are formed at each ward of Customer Care dept. to facilitate RTS connections. Total installed capacity of Rooftop Solar system (all categories) in BEST's licensed area as on 31.03.2024 is 16.80 MW.

2.2) BEST has signed Power purchase Agreement for procurement of 634 MW Wind Solar Hybrid power with Solar Energy Corporation of India (SECI). BEST will supply environment friendly green power to its consumer from Mar 25, onwards.

2.3) BEST has deployed 185 nos. of Electric Vehicles in place of Fossil Fuel operated Vehicles for its departmental works.

2.4) 45 nos. of charging stations with 140 charging points for private electric vehicle, 7 nos. of charging stations with 100 charging points for Public Transport vehicles and 20 nos. of charging Stations with 117 charging points for departmental vehicles are operational in BEST's premises.

Maharashtra State Electricity Distribution Company Limited

Table No.14.1: BEST Consumers, Connected load and Consumption for the year 2023-24					
Sr. No.	Consumers Category	Mumbai City			
		Consumers #	Connected Load in kW	Consumption in Million Units (MUs)	Avg. Monthly Consumption (MUs) = e/12
1	HV Consumers	194	425.35	655.82	54.65
2	LV Consumers	1052531	4298.87	4084.34	340.36
	Total	**1052725**	**4724.22**	**4740.15**	**395.01**

Table No.14.2: Category wise Consumers, Connected Load and Consumption (2023-24)					
Sr. No.	Consumers Category	Mumbai City			
		Consumers #	Connected Load in kW	Consumption in Million Units (MUs)	Avg. Monthly Consumption (MUs) = e/12
1	Residential	772552	2649.72	2195.16	182.93
2	Commercial	270068	1847.48	2141.15	178.43
3	Industrial	8990	195.29	360.06	30.01
4	E. V. Charging	617	26.75	27.00	2.25
5	Agriculture	2	0.05	0.16	0.013
6	Public Lighting	496	4.93	16.62	1.39
	TOTAL	**1052725**	**4724.22**	**4740.15**	**395.01**

Meters installed on site

Maharashtra State Electricity Distribution Company Limited Thane urban zone supplies electricity to Bhandup and Mulund area of BrihanMumbai Municipal Corporation. Bhandup and Mulund Zonewise information is as follows.

Table No. 14.3: MSEDCL's Consumers, Connected Load and Consumption in MU's for F.Y. 2023-24							
Sr. No.	Category	Division Name					
		Bhandup			Mulund		
		Total Consumers	Connected load (KW)	Consumption (MU's)	Total Consumers	Connected load (KW)	Consumption (MU's)
1.	High Voltage Consumers	87	155846	169.72	47	34360	41.33
2.	Low Voltage Consumers	188558	340656.48	490.45	134445	459606.32	419.50
	Total	**188645**	**496502.48**	**660.07**	**134492**	**459606.32**	**460.83**

Source : Maharashtra State Electricity Distribution Company Limited

Table No. 14.4: MSEDCL Category wise Consumers, Connected Load and Consumption in MU's for F.Y. 2023-24

Sr. No.	Category	Division Name					
		Bhandup			Mulund		
		Total Consumers	Connected load (KW)	Consumption (MU's)	Total Consumers	Connected load (KW)	Consumption (MU's)
1.	Residential	164633	261470.95	300.03	116727	336572.16	289.36
2.	Commercial	18602	70999.97	78.56	15590	78047.18	83.72
3.	Industrial	4633	70887.01	102.03	1112	23710.86	33.58
4.	Others	690	8646.69	9.69	1016	10828.28	12.76
	Total	**188645**	**496502.48**	**660.07**	**134492**	**459606.32**	**460.83**

Source : Maharashtra State Electricity Distribution Company Limited

Table No. 14.5: MSEDCL's Consumers Average Consumption of energy in MU's for F.Y. 2023-24

LT Categorywise consumers	Average Consumption in MU's		
	Bhandup Division	Mulund Division	Total Avg. Consumption
High Voltage Consumers	14	3	17
Low Voltage Consumers	41	35	76
Total	**55**	**38**	**93**

Table No. 14.6: MSEDCL's Categorywise Average Consumption of energy in MU's for F.Y. 2023-24

LT Categorywise consumers	Average Consumption in MU's		
	Bhandup Division	Mulund Division	Total Avg. Consumption
Residential	25	24	49
Commercial	7	7	14
Industrial	9	3	12
Others	1	1	2
Total	**55**	**38**	**93**

15. ROADS AND TRANSPORT

Roads

1) Road Improvement:

About 2050 K.M. of roads are maintained by Brihanmumbai Municipal Corporation. DP roads proposed in the DPDCR 2034 of Brihanmumbai\ Municipal Corporation, are being developed on priority after acquisition of land by DP department. Considering the heavy traffic, Bottleneck, the RL of respective road is increased and Roads are widened as per recommendation of ward offices. In past the roads were improved mainly using paver blocks, Bituminous concrete, Mastic asphalt etc. Roads are damage due to the heavy rainfall in short period of time, density of traffic, movement of heavy vehicles, frequent trenching work by Utility agencies. Hence in order to improve the road surface and make the road pothole free, Brihanmumbai Municipal Corporation has decided to improve all the roads in cement concrete. About 1224K.M. of roads are already concretised within Brihanmumbai Municipal Corporation jurisdiction further work of construction of roads of about 412K.M. lengths is in progress. In addition to that 6 Mega tenders are invited for construction of 381K.M. of roads. These tenders include the work of provision of utility ducts to lay utility cables, so as to avoid frequent trenching work. Due to the concretization of roads all the roads will be pothole free, due to smooth traffic flow there will be saving in time and fuel, also due to traffic less smooth ride there will be remarkable improvement in health of commuters.

The work of reinstatement of trenches is being carried out under strict supervision of quality monitoring agencies. Further tender conditions are also made stringent to have good quality work.

During monsoon, cold mix is used to fill up the potholes on roads having width less than 6 m. For roads having width more than 6 m. mastic is being used. Eastern Express Highway and Western Express Highway, within

Brihanmumbai Municipal Corporation jurisdiction are handed over to Brihanmumbai Municipal

Corporation for repairs and maintenance work. The work of preventive maintenance and beautification of Highways is being carried out by Brihanmumbai Municipal Corporation.

2. Footpath policy

For free uninterrupted movement of pedestrians, Brinhanmumbai Municipal Corporation has adopted new footpath policy 'Universal footpath policy' in the year 2023. In the said policy various aspects such as width of footpath. Surface of footpath, Pedestrian Zone, Furniture Zone are elaborated. In order to improve the strength and beauty of footpath, all the footpaths are being improved in stamped concrete.

3. Use of Information Technology

To get quick information about the status of various roads which are in progress, use of Dashboard is proposed.

To know the exact location of utility cables below the road, utility agencies are insisted to mark the location of their utility in GIS system.

To give permission to utility agencies within stipulated time period and to control the unauthorized trenching work new technology 'Call before You Dig (CbUD)' will be adopted in coordination with state government. Brihanmumbai Municipal Corporation has CPWM Portal for giving trench permission which will be connected to state governments Gati shakti/Mahasanchar Portal. It is proposed to make digitization of information of all roads.

Traffic

1. Traffic Engineering

Traffic Planning & Co-Ordination is headed by the Dy.Ch.Eng. (Traffic). This department issues parking layout remarks online received through the Auto DCR system. No any physical parking layout remarks are issued. Remarks regarding prescribing of new streets & widening of existing streets by provision of MMC Act 1888, design &construction of traffic island, maintenance of traffic signal & new signals, fixing of sign boards, direction boards, traffic related amenities, tendering work of on street & off street pay and park sites after taking over from the respective developer BMC's traffic department is coordinating with Traffic police department & various works related to smoothening of traffic flow in the city & beautification works guided by this department.

This office prepares policy for providing street light on newly constructed roads as well as improvement of existing street lighting & making co-ordination with all Ward offices to get the above works done through three service provider electric companies viz. BEST, Adani Electricity & MSEB Co. Ltd. The budget provision for the same is made by traffic department.

2. Parking Policy

In order to avoid traffic congestion due to unauthorized parking on roads tender procedure has been initiated for execution of on-street and off-street parking schemes. Out of 69 pay & park schemes on roads contractors have been appointed for 63 sites to start pay & park scheme. Similarly out of 33 Public Parking Lot contractors have been appointed for 32 sites are in operation, which have been handed over Brihanmumbai Municipal Corporation under DC Regulation no. 33 (24) of 1991 and Regulation no. 33 (18) of DCPR 2034. There are 29 nos. of amenity parking places handed over to Brihanmumbai Municipal Corporation.

3. Multilevel Robotic Car Parking

The contractor has appointed for the 546 capacity of robotic multilevel parking at near Mumbadevi temple in C ward, 475 capacity of robotic multilevel parking at Central Matunga Railway Station in F/N ward & 194 capacity of robotic multilevel parking at Flora Fountain (Hutatma Chowk) near Apsara Pen shop. Also the tender procedure is completed and Letter of

Acceptance is awarded to contractor for the capacity of 640 Four Wheeler & 112 Two Wheeler multilevel robotic car parking at Worli Engineering Hub in G/S ward. Accordingly, parking capacity of around 1850 will be available in near future.

4. LED Lights

Brihanmumbai Municipal Corporation has started the implementation of fixing LED street lights in 2022-23. There are about 1,41,145 Sodium vapor lamps in Mumbai out of which 1,36,211 conventional lamps have been replaced by LED. It is proposed to complete balance 4,766 LED lights in Mumbai for year 2024-25. This causes more savings in energy bill. This savings in energy will go up as more lights will be converted to LED.

5. Traffic Signages

Brihanmumbai Municipal Corporation has appointed contractor for modern signages with upgradation of signages in City, Western Suburbs & Eastern Suburbs for an amount of nearly 60 Crores each for the period of two years and the work is in progress.

6. Initiative on Road Safety & High Risk Intersections (Black Spots).

As reported by the traffic police, 20 High Risk Intersections (black spots) in Brihanmumbai in 2022. For remedial measures of the said High Risk Intersections (black spots), Brihanmumbai Municipal Corporation is taking help of NGO, M/s. Bloomberg Philanthropies as a consultant. The aim is to review the High Risk Intersections (black spots) for conducting various engineering and traffic flow studies and to undertake appropriate engineering and planning interventions that can bear higher

impact in saving lives on the road. Accordingly, NGO and his partner has submitted / being the report to the Chief Eng (Roads & Traffic). As per the said report, the concerned Deputy Chief

Engineer (Roads) and concerned Ward Offices will take the necessary action on remedial measures. Also, in future, if traffic police informed the High Risk Intersections (black spots), the same procedure will be followed for eradicate High Risk Intersections (black spots).

7. Area Traffic Control (ATC)

At present 258 Signals in Greater Mumbai has already been converted into fully adaptive automated Signal System and are working satisfactorily. The maintenance of remaining 412 conventional systems and 208 flashing beacons are being carried out.

16. BRIDGES IN MUMBAI

Major works completed during year 2023-24

1) Borivali – Work of Construction of Bridge on Dahisar River at Shri Krishna Nagar is completed.

2) The work of Reconstruction of The Gopal Krishna Gokhale Bridge Phase - 1 at Andheri is completed.

3) Lower Parel – Delisle Road Bridge work is completed.

4) Andheri (East) – Teligalli Flyover Bridge work is completed.

Major works undertaken during year 2024-25

1. Mumbai Coastal Road North - Versova to Dahisar 6 Packgages A, B,C, D, E, F.

2. Construction of 45 mt. Wide elevated road from Dahisar in BMC Limits to Bhayander (W) in BMC limits.

3. Design and Construction of Flyovers and Elevated Rotary along Goregaon Mulund Link Road at

   a. Junction near Ratnagiri Hotel, Goregaon (E).

   b. Junction of G. G. Singh Road and GMLR, Mulund (W).

   c. Hedgewar Junction, Mulund (W).

4 Design Construction and Operation of twin tunnel from Film City Goregaon to Khindipada(Amar Nagar) Mulund Inclunding Box Tunnel (Cut and Cover) at Film City, Electrical, Mechanical and Associated Works.

5. Proposed construction of Bridge across Boundary Nalla near MHADA Bus Depot at Mulund East connecting to the proposed 18.30 m wide DP road upto Hari Om Nagar near Boundary of Thane Jurisdiction.

The statastical information (April 2023 to March 2024) of bridges in City, Eastern & Western Sub. Under Chief Engineer, Bridges.

Sr. No.	Description	City	Western Suburb	Eastern Suburb	Total
1	Bridge Over Nalla or River (Vehicular) (BR)	16	140	143	299
2	Road over Bridge (Vehicular) across railway (ROB)	28	9	4	41
3	Bridge across road junction or over roads (Flyover)	13	17	18	48
4	Foot Over Bridge (FOB)	28	36	41	105
5	Skywalk	4	10	7	21
6	Foot Over Bridge over Riilway Track (FOBRL)	10	14	0	24
7	Vehicular Subway (VS)	0	16	1	17
8	Pedestrain Subway (PS)	9	19	8	36
9	Underpass	0	2	0	2
10	Freeway	1	0	2	3
11	Tunnel	0	0	1	1
	Total	**109**	**263**	**225**	**597**

Source : This information is received from RTO, GoM

Surface Transport

There are different types of vehicles plying on the roads of Mumbai every day. They consist of cars, taxis, trucks, buses, three-wheelers, two-wheelers etc. The total number of vehicles in Mumbai as on March 2024 is 47,59,976. Their composition is 59.25% two-wheelers, 29.02% cars, jeeps and station wagons, 3.08% taxis/cabs, 5.15% auto rickshaws, 0.32% buses, 0.35% Goods vehicles, 0.02% tractors/ trailers and others 2.82%. As previous year increasing number of vehicles is 4.91% in Mumbai city. Table no. 16.1 shows number of different vehicle in Mumbai.

Table No 16.1 – Category-wise comparison of vehicle population 2022-24

Sr. No.	Category	As on 31st March		
		2022	2023	2024
1	Two Wheelers	2541033	2690367	2820296
2	Cars, Jeep, Station wagons	1252246	1329795	1381352
3	Taxi/Cabs	124115	131900	146739
4	Auto-rikshaws	233325	235602	244959
5	Buses	3086	13372	15009
6	Trucks & Lorries	6514	11908	16624
7	Tractor/ Trailors	384	425	821
8	Other	120548	123842	134176
	Total	**4281251**	**4537211**	**4759976**

Source : RTO, GoM

Chart No. 16.1 (A): Category wise Vehicle Population in Mumbai

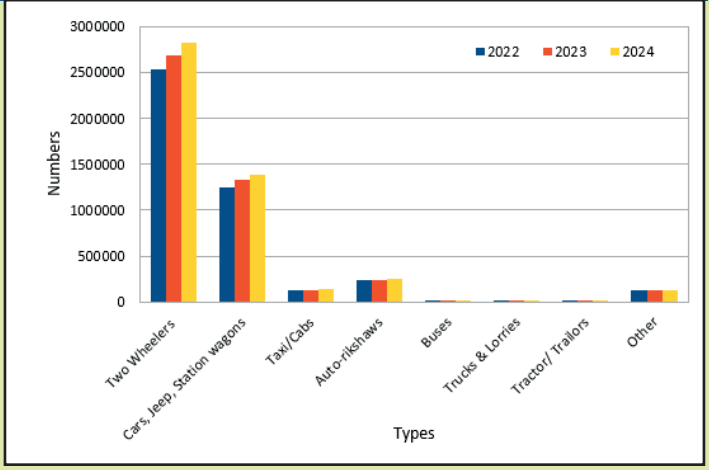


Chart No. 16.1 (B): Types of Vehicles

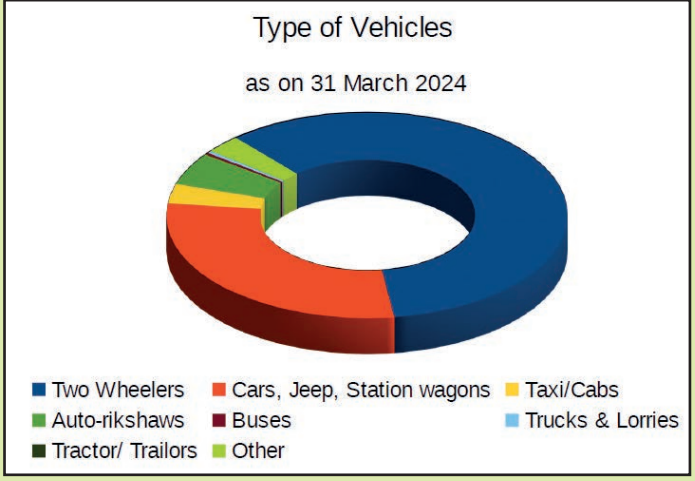


Table No 16.2 – Fuelwise Vehicle Population in Greater Mumbai Office as on 31st March 2024								
Sr. No.	**Category**	**Disel**	**Petrol**	**LPG**	**CNG**	**Electric**	**Others**	**Total**
1	Motor Cycles	0	2107447	0	4	15422	229	2123102
2	Scooters	0	665026	0	0	15	0	665041
3	Moped	0	32133	0	0	20	0	32153
	Total Two Wheelers	**0**	**2804606**	**0**	**4**	**15457**	**229**	**2820296**
4	Cars	334137	886184	10481	103128	10311	3754	1347995
5	Jeeps	29040	480	4	87	0	0	29611
6	Stn. Wagons	3039	707	0	0	0	0	3746
		366216	**887371**	**10485**	**103215**	**10311**	**3754**	**1381352**
7(a)	Taxis meter fited	1982	1426	532	40726	0	77	44743
7(b)	Luxury/ Tourist Cabs	43105	34367	378	21440	1749	957	101996
		45087	**35793**	**910**	**62166**	**1749**	**1034**	**146739**
8	Auto-rikshaws	20	62	4	239241	476	5156	244959
9	Stage carriages	4280	552	0	2015	114	0	6961
10	Contract carriages/ Mini Bus	9286	181	1	1113	558	328	11467
11	School Bus	2622	177	1	712	28	2	3542
12	Private Service Vehicle	1026	19	2	96	0	0	11143
		17214	**929**	**4**	**3936**	**700**	**330**	**268072**
13	Ambulances	1781	363	0	147	0	4	2295
14	Articulated/ Multi	257	0	0	0	2	18	277
15	Truck and Lorries	15930	423	0	270	0	1	16624
16	Tanker	1174	2	0	0	0	0	1176
17	Delivery Van (4 wheelers)	61824	8242	4	9610	235	110	80025
18	Delivery Van (3 wheelers)	24339	4811	9	4362	681	106	34308
		103524	**13478**	**13**	**14242**	**918**	**235**	**132410**
19	Tractors	477	10	0	0	0	0	487
20	Trailors	303	2	0	0	0	29	334
		780	**12**	**0**	**0**	**0**	**29**	**821**
21	Others	6740	592	2	191	439	27	7991
		8521	**955**	**2**	**338**	**439**	**31**	**10286**
	TOTAL	**541362**	**3743206**	**11418**	**423142**	**30050**	**10798**	**4759976**

Source : RTO, GoM

There are 1,46,739 metered taxis in Mumbai operating on petrol, diesel, CNG and LPG as on 31st March 2024. CNG, LPG and Electric which are regarded as clean fuel. More than 44% meter taxis and 97.86% rickshaws are running on clean fuel CNG, LPG and Electric.

Chart No. 16.2: Fuelwise Vehicle Population in Greater Mumbai Office as on 31st March 2024

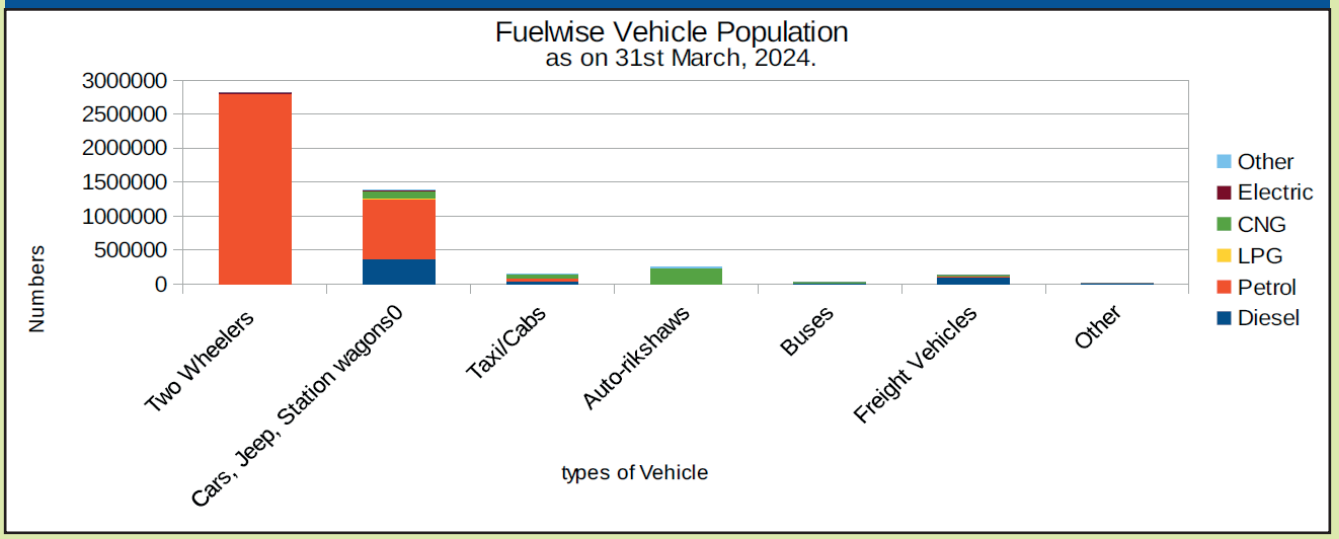
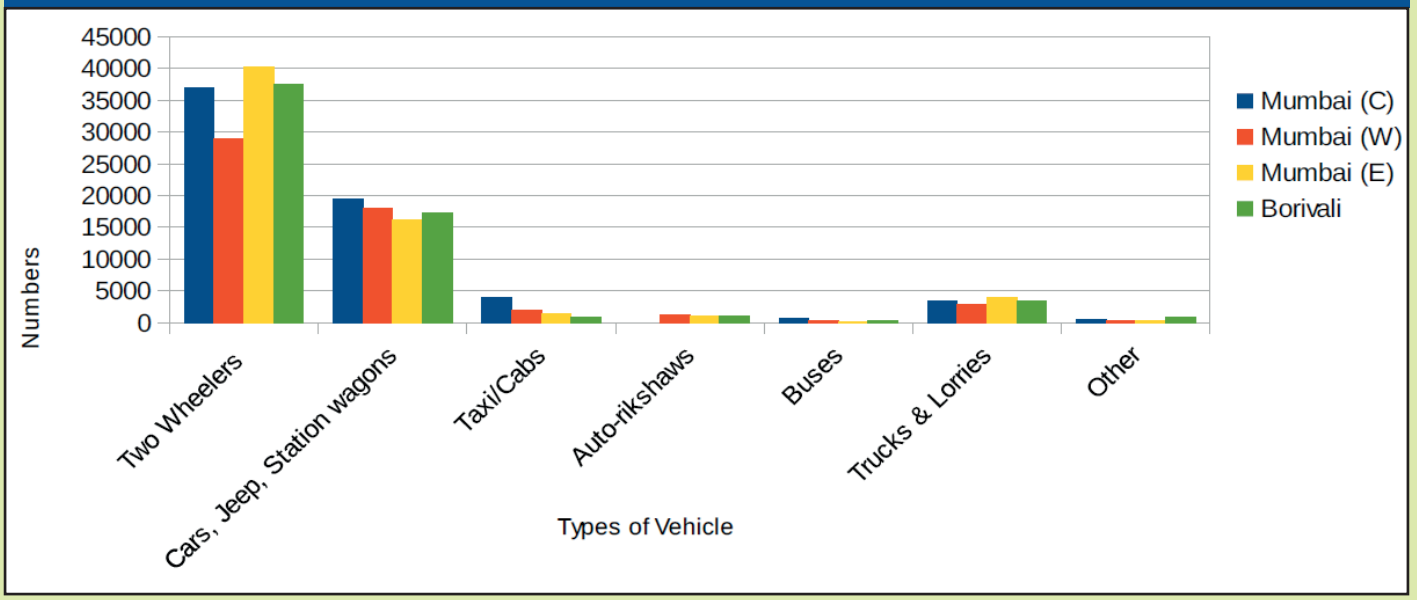


Table No 16.3 – New Vehicles Registration during April 2023 to March 2024

Sr. No.	Category	Mumbai (C)	Mumbai (W)	Mumbai (E)	Borivali	Gr. Mumbai
1	Motor Cycles	36875	28907	40281	37588	143651
2	Scooters	0	4	0	2	6
3	Moped	21	6	19	7	53
	Total Two Wheelers	36896	28917	40300	37597	143710
4	Cars	19547	17994	16205	17268	71014
5	Jeeps	0	0	0	0	0
6	Stn. Wagons	0	0	0	32	32
7(a)	Taxis meter fited	495	0	0	0	495
7(b)	Luxury/ Turist Cabs	3427	1832	1481	876	7616
8	Auto-rikshaws	0	1164	971	998	3133
9	Stage carriages	70	56	0	0	126
10	Contract carriages/Mini Bus	567	66	145	280	1058
11	School Bus	76	108	18	12	214
12	Private Service Vehicle	12	7	4	10	33
13	Ambulances	37	23	25	23	108
14	Articulated/ Multi	12	0	12	9	33
15	Truck and Lorries	406	0	1246	1501	3153
16	Tanker	70	0	32	3	105
17	Delivery Van (4 wheelers)	2559	2132	2067	1235	7993
18	Delivery Van (3 wheelers)	266	642	620	721	2249
19	Tractors	13	4	2	1	20
20	Trailors	0	16	0	4	20
21	Others	373	157	171	866	1567
	Total	**64826**	**53118**	**63299**	**61436**	**242679**

Source : RTO, GoM

Chart No. 16.3: Regionwise New Vehicle Registration during April 2023 - March 2024



In Mumbai region about 2,63,219 various types of vehicles are registered during April 2023 to March 2024. In this 57.88% of two wheelers, 26.99% of cars, jeeps and station wagons, 5.55% of taxi/cabs, 3.14% of Auto rikshwa's, 0.79% of buses, 4.76%, goods vehicles 0.15% of Tractors/Trailors and 0.74% of other vehicles.

BEST – Transport

Transport Engineering Department

BEST Undertaking have 1085 nos. of self own buses and 2075 no. of buses on wet lease model. Total 3160 no. of buses are used for the public transportaϴon. 80 % of the buses are environment friendly (CNG & Electrical).

1. Steps taken for pollution control,

BEST Undertaking have 63.29% CNG vehicles and 20.09 % electrical vehicles in the fleet. Total 635 no. of electrical vehicles (339 Single decker, 50 Double decker, 246 Midi). Due to operation of these electrical buses 37.8 million kg of Carbon Dioxide was emitated out of environment.

2. Enhancement of E-Bus fleet :-

Presently 635 electric buses are in operation and contract work order of 4950 Electric buses (4750 SD & 200 DD) is placed. By year 2024 end, more than 50 % fleet of Undertaking will be electric and by 2027, entire fleet of BEST Undertaking will be electric buses. This will help to reduce the pollution of Mumbai city as 318296 tons of CO2 per year will be reduced by operation of these buses.

3. Premium Electric bus service:-

BEST Undertaking have started premium AC bus service for daily car owners. Till date 99 nos. of electrical AC buses out of 147 have been operated under this project.

4. Private vehicles charging stations:-

To promote electrical vehicles in Mumbai city, BEST Undertaking have installed private charging stations at 59 locations in various BEST depots, Terminus and Quarters.

5. E-Cars for Officers & Staff of various departments:-

Total 141 no. of electrical cars are being used for Officers and Staff of various department.

6. Hazardous waste disposal:-

a) BEST Undertaking is a PSU into public city transport and electric supply for citizens of Mumbai city. The hazardous waste generated that is the drained engine oils, grease, batteries, etc which are used for preventive maintenance of buses and the Transformer oil, lead, etc used by Electric supply department, is collected at our centralized location at Oshiwara Depot and is disposed off through registered recycling firms, as per the guidelines of Pollution Control Board. Periodic statement is submitted to Maharashtra Pollution Control Board by our Material Management Department. The summary of hazardous waste disposed off through registered recycling firms; for the period of January-23 to December-23 is as below:

Sr. No.	Description	Approx. Total Qty.
	Used oil/Waste oil	79170 litres (71.253 MT)
2.	Lead sheets	3.00 MT
3.	Used batteries (Apr-23 to Sep-23)	1595 nos. (85.033 MT)
4.	Used batteries (Oct-23 to Mar-24)	1774 nos. (68.601 MT)

b) BEST are member of M/s Mumbai Waste Management Pvt. Ltd., Taloja the authorized firm of Maharashtra Pollution Control Board, under membership no. MWML-MUM- HZW-MUM-2899 for disposal of used filter. Periodically the used oil filter accumulated at Depots are sent to this disposal facility. In 2023-24, total 2.5 MT of used oil filters are sent to this facility for disposal.


ZERO EMISSION
PURE ELECTRIC


AEROCARE
CHARGE
EV HERE

17. MUMBAI COASTAL ROAD

The Mumbai Coastal Rroad Project (South)

The Mumbai coastal road project (South) is one of the most prestigious projects undertaken b A.C.G.M. This Southern Coastal Road Project of 10.58 km from Princess Street Flyover to Worli End of Bandra Worli Sea Link is proposed to resolve the traffic congestion in Mumbai. In addition this road will provide several environmental friendly features to the city. The proposed Coastal Road is having eight lanes (4+4) configuration comprising road based on reclamation, Bridges, elevated roads and tunnels.

The Mumbai Coastal Road Project will reduce the travel time, decongest existing roads, reduce the air and noise pollution levels, improve public transport facility due to proposed dedicated BRTS lane and also generate much needed additional green spaces which will also decrease Co, emission.

The Ministry of Environment, Forest and Climate Changes (MoEF&CC) has issued CRZ Clearance for the Project on 11.05.2017 and amendment on 18.05.2021. Also, the NOC's from other concerned departments of Central Government and State Government have been obtained for Mumbai Coastal Road (South) Project.

The total Estimated Project Cost is Rs. 13983.83 Cr. This Project is divided into three packages viz. Package-IV (From Princess Street Flyover to Priyadarshini Park), Package-1 (From Priyadarshini Park to Baroda Palace) and Package-ll (From Baroda Palace to Worli End of Bandra Worli Sea Link). The design and Build work for Package I and Package IV is under progress through the contractor M/s. Larsen and Toubro Ltd. and for Package Il through the contractor M/s. H.C.C.- H.D.C. (joint Venture). For each Package one Project Management Consultant (PMC) has been appointed as Employer's Personnel for supervisions and other allied works. Accordingly M/s Yooshin Engineering Corporation+ M/s Tec Cuatro S.A(JV), M/s Louis Berger Consulting Pvt. Ltd and M/s Egis India

Table No.17.1: The salient feature of the Coastal Road Project

1.	Length	10.58 km
2.	Road on reclamation	4.35 km
3.	Tunnel (3 Lanes, 11m internal dia.) x 2 Tubes	2.07 km
4.	Bridges (4+4 Lanes)	2.19 km
5.	Interchanges (Amarson, Haji Ali and Worli)	3 nos.
6.	Seawall Length	7.47 km
7.	Reclamation area	111 hectare
8.	Reclamation area (Garden, Landscape, Parks etc.)	70 hectare
9.	Promenade (8 m to 20 m wide)	7.50km
10.	Pedestrian Underpassess	16 nos.
11.	Underground Carparks	4 Locations (about 1800-Lots)
12.	Generation of approximately employment opportunity due to proposed Coastal Road	1,00,000
13.	BRTS, dedicated lanes for Ambulance	
14.	Sophisticated Saccardo Nozzle Ventilation system and special fire protective coating in tunnel.	
15.	Flood risk minimizes due to better designed drainage system along with automate anti-flood gates and box culverts of total length 1,650m.	

Consulting Engineers Pvt. Ltd Cullen Grummit & Roe(UK) Ltd.(IV) have been appointed as PMCs for Package IV, I & II respectively. Also one General Consultant M/s AECOM Asia Co. Ltd is appointed as Employer's representative for co- ordination and monitoring the entire project through all PMCs and other allied works.

This work is in progress since October 2018 and expected to be completed in May 2024 . The required Budget Provision of Rs.3000 cr. has been made in the financial year 2023-2024.

Salient Features of Site Environment Management Plan for the Project

Brihanmumbai Municipal Corporation has awarded Civil Contracts of all the three Packages of Coastal Road to recognized International Contractors like L&T, HCC-HDC (JV).

The following compliance are done/ in progress through all contractors regarding Environmental Compliance mentioned in Site specific Environment Plan as well as requirements of MOEF&CC applicable to them.

1. Air and Noise Monitoring is being done on sites and compared with Pre construction results (Base-LineData) and Standards of MOEF and MPCB
2. For controlling dust, Contractors are doing Water Sprinkling on their sites during construction work.
3. Wheel Wash Facilities is also provided at every Main Entrance and Exit of site where Vehicle Movement is there.
4. Noise Barriers are being provided at all Critical Locations like Near Schools and Hospitals etc. during Construction.
5. All Construction vehicles are provided with Noise Mufflers, Good Silencers on sites.
6. All Construction sites are barricaded by barricading boards in addition to Noise Barriers to Control Noise and demarcate site from General Public and Road users.
7. Preventive Maintenance schedule for all construction Machinery at site. All construction machinery is having PUC certificates. Preventive Maintenance of Machinery will also reduce noise from Machinery.
8. All rotating parts of construction machineries have provided with canopies and grills to control rotating parts noise during construction phase.
9. Contractors have provided Bio Toilets on sites.
10. The corals noticed along the Mumbai coast in Worli region and in Haji Ali region covering an area

of 0.251 m2 and 0.11 m2 respectively. Brihanmumbai Municipal Corporation has taken the necessary permit from the Chief Wildlife Warden to translocate the Corals and appointed CSIR-NIO a Govt. agency through Contractors to carry out the work of translocation of corals and successfully carried out translocation of corals by Brihanmumbai Municipal Corporation through the CSIR-NIO agency in the presence of authorized officers of Mangrove cell of Forest department. No damage was found to the other wildlife species during translocation process. Further regular monitoring to observe coral health and survival in the region has been carried out by CSIR-NIO for one year and as mentioned in monitoring report of NIO, it is found that survival rate of Corals is 100% in May 2021.

11. National Institute of Oceanography (NIO), Dona Paula, Goa is engaged for investigation on impact of Coastal Road project waves, water levels, seawater quality and related environemntal aspects during progress of work and 2 years in operation phase.

12. Brihanmumbai Municipal Corporation has deposited 2% of total cost of the project (i.e. Rs.175.33 Cr) for conservation of coastal and marine biodiversity to the Mangrove Foundation of Maharashtra. The Mangrove Cell tied up with National Institute of Oceanography (NIO), Mumbai for establishment of artificial reef along the project coast as a pilot project. Artificial reef is a human created underwater structure, typically built to promote marine life. It generally provides hard surfaces were algae and invertebrates such as barnacles, corals and oyster attach. The accumulation of attached marine life in turn provides food and shelter for assemblages of fish and it enhances marine ecosystem.

18. EDUCATION

As per the directives laid under Section 61 (Q) of the MMC ACT 1888, providing free Primary Education to the Children of Mumbai, is obligatory and binding duty of the Municipal Corporation of Greater Mumbai. Since 1907, Brihanmumbai Municipal Corporation Education Department has been accomplishing this responsibility.

In the academic year 2023-24, through eight mediums in 963 primary schools of BMC 2,60,798 students are catered quality education. For this purpose, 5,892 highly proficient and dedicated teachers are working diligently. Also, our 75 teachers are engaged in the services of our 907 specially-abled students from 19 BMC special schools.

In the academic year 2023-24, 49 Aided & 199 Unaided including MPS schools are run by MCGM. A total of 248 schools are there in secondary sections.

In march 2023-24 a total of 46,660 students (Aided - 16177, Unaided including MPS - 30483) are beneficiaries of BMC secondary schools. Education is imparted through Marathi, Hindi, English, Urdu, Gujrati, Telugu, Kannada, Tamil mediums. R. C. Urdu Teacher College, Imamwada and R. C. Urdu Jr. College, Mahim are administered by BMC on subsidized basis.

From the year 2007 – 08 BMC has launched English medium schools under the name of 'MUMBAI PUBLIC SCHOOL' in which education facility from Jr. Kg. to 10 th STD has been provided.

Private Primary Schools:

BMC Education Department regulates the private primary schools issuing recognition and registration certificates to them. Also, it helps in the effective running of the administration and affairs of the said schools. Aided and unaided schools are functioning under the supervision of the Deputy Education Officer (Private Primary Section).

Type of school	No. of Schools	No. of Students	No. of Teachers
Aided	381	103830	2558
Unaided	676	297254	7639

Tree Plantation:

Planting and conservation of trees is very important to prevent air pollution. To inculcate this concept in the minds of students, World Environment Day was celebrated on 5th June 2023 at the school level. For this, various plants were planted by the students. The students were made aware of all the care that is taken till these plants turn into trees. Similarly, actual videos of the remarkable achievements of various villages in the context of tree planting and the villages that have prospered through it were shown. Accordingly, the project of planting trees in the school premises was completed. Regarding this subject, public awareness was created by conducting various painting competitions, essay competitions, and elocution competitions at the school level.

Fuel Conservation:

Due to the use of modern vehicles in today's era, consumption of petrol and diesel is increased. The smoke emitting from it immediately affects the various organs of the human being evidently degrading the average level of human health. The students and parents were provided with the guidance that, the solution to all this is that we ourselves as well as the students should commute by public vehicles instead of their private vehicles and, also favouring non-polluting vehicles like bicycles as an alternative. The students were encourage to make maximum use of Bi-cycle which is a non-petrol vehicle also is very beneficial for them. This not only gives physical exercise but also develops self-consistency. Vehicles that are currently in use should be inspected regularly since very old vehicles can increase pollution. Students were advised not to use such vehicles. drawing competition and Elocution competition of students were conducted on the topic of fuel conservation.

Homemade Organic Manure Production:

In order to properly utilize the various wastes in their homes, the parents and students were guided to make organic manure at home from various wastes coming from their household manure such as vegetable peels, fruit peels, dried leaves of plants, dried flowers from garlands used in the temple etc. The process of production of this manure was demonstrated by the teachers to students of the school and the manure thus produced was used for the school kitchen garden. A model of the said organic fertilizer was kept in the science exhibition held in R/Central ward.

Ban on use of plastic:

Excessive use of plastic day by day, is deeply affecting every element of the environment. As plastic does not decompose, the problem of where and how to dispose off plastic materials is frequently raised. Millions of people have been employed by the plastic industry, yet it is dangerous to continue using plastic only because it is the means of generating employment. So, at the school level students and parents were made aware to minimize use of plastic for example they were instructed to bring a steel water bottle, steel tiffin box instead of a plastic water bottle or tiffin. Also they were told to use

cloth bag instead of plastic bag for shopping or carrying things. Also, morning rally were conducted by writing slogans on plastic ban to create public awareness. Essay competition, drawing competition, craft competition, slogan writing competition were conducted in various schools. All the teachers and students of the school happily participated in it.

Proper use of water:

We all know that only 29% of the earth is water. Only three percent of that water is used for drinking. The concept of 'Water is Life' was inculcated in the minds of the children. Students are advised to use water sparingly during mid- meal break. If there is shortage of water, we will have to buy this water. All the students have been instructed not to throw out the water in the water bottle but to fill the bottle with fresh water only after the water bottle is completely empty. Eacgers were successful in imbibing importance of water to students.

On the topic of proper use of water, schools conducted drawing , essay competition, elocution competition and, also morning rally were organized writing slogans in the school'sv premises. Also, the parents were requested and advised to reduce the amount of water they use for household work, so that they don't have water shortage in the future.

Scout-Guide:

Scout-Guide is an 'International Movement', based on the four pillars of scouting i.e. Character building, Service to Mankind, Intelligence and Health & Craftsmanship respectively.

With the help of 'World Resource Institute, Parel (NGO) Urban Vegetable Farming projects is being implemented for the BMC students at the Scout-Guide Training Centre, Powai. 'Kitchen Garden' subject is included in scout-guide syllabus. Hence, Rajyapuraskar & Rashtrapati puraskar students should master in the subject and achieve the proficiency badge of 'Kitchen Garden'. Also, to check the increasing pollution and curb the Globing Warming, the earth must be full of greenery. Keeping all these points in focus, the 'Urban Vegetable Farming project has been carried out.

Tree plantation drive was takrn at the Scout-Guide Dist. Training Centre in which about 200 plants were planted by the hands of education department officers. Scout-Guide students of different schools also carried out the tree plantation project in their respective schools. Students held rallies and different activities in school surrounding areas for Public Awareness imparting tree plantation importance. This year CACR trust also planted trees at the Scout-Guide Dist. Training Centre.

In 2023-24, all the activities are conducted as per the scout-guide year planning.

HOUSEKEEPING:

Recruitment of external contractors for housekeeping was started from 2009 by inviting Tenders

through public news-paper for sanitation, security, and cleanliness of surrounding for all school buildings under Brihanmumbai Municipal corporation. Accordingly for the period from 2016 to 2019, for the sanitation, safety and cleanliness of the schools and surrounding area of the schools as well as to prevent anti-social behaviour from outsiders, the M/s. BVG Pvt. Ltd. M/s. Brisk India Pvt. Ltd. & Krystal Integrated service Pvt. Ltd. has been appointed for City, Eastern & Western suburb respectively. Therefore, the cleanliness of the schools of BMC and the Health of the student in the schools have been maintained. Also, since the surrounding are being cleaned, it is helping to maintain the balance of the environment. At present, for the year 2022 to 2025 Contractor is appointed for sanitation, protection & maintenance of 469 School buildings of BMC. Sanitation, Security and Cleanliness of surrounding for all school buildings is regularly carried out by appointed contractors.

Sanitary Napkin

Since 2018, sanitary Napkins with disposable pouches are being provided with Vending Machines for the girl students of 6th to 8th std by the Brihanmumbai Municipal schools. At present, Sanitary Napkins have been supplied to the students of Municipal Schools till the year 2023.

MUSIC AND ART ACADEMY:

Music Section:

Environmental Songs: Every year, songs on environmental protection / conservation, cleanliness are included in the music curriculum. It includes forest conservation, water conservation, tree plantation, environment / physical cleanliness. Through various social media platforms, these songs from the syllabus are broadcasted all over India and out-side of India through YouTube. These songs have received many viewers.

ENVIRONMENT SONG - https://youtu.be/1u1J3IKUOHA

CLEANLINESS SONG - https://youtu.be/STVhDEEJY9W

PHYSICAL HYGIENE SONG - https://youtu.be/31023Q06ZGE

WATER CONSERVATION SONG - https://youtu.be/00J5kshNast

ENVIRONMENT CONSERVATION SONG - https://youtu.be/ffaOmnT3zk

The students of standard 6th to 8th across the entire Municipality are taught the importance of environment conservation through those songs.

In various social media these songs from the syllabus are broadcasted all over India and out of India through YouTube.

The street drama competition organized by Municipal Corporation every year includes environment improvement topics.

ART :

Sri Ganesh Idol Clay Workshop:

Environmental damage is caused due to Ganesh idols made from plaster of paris. To create environmental awareness amongst the citizens and students regarding its deterioration, a workshop was organised by BMC Education department. The purpose of workshop along with environment awareness was also to allow students to take first-hand experience of handling various mediums of art and to give scope to their creativity. In the subject of sculpture, shadu soil was used to make idols and like every year this soil work workshop was arranged from 12 th – 14 th September at central level. In this workshop 390 students from multilingual school of BMC took part.

Shiv vaibhav Fort (Gad Durg) Replica Creation Sculpture Competition.

Chhatrapati Shivaji Maharaj, the adorable deity of Maharashtra, built various forts for the creation and protection of Swarajya. Witnessing history. Hence for giving scope for creativity, sculpture; and also as the [process of "Shiva Vaibhav Fort (Gad durg) Replica Creation Sculpture Competition" was organized from the schools of Brihanmumbai Municipal Corporation. It helped to inculcate the culture of bravery and self-respect in the children. It was held on 27 October 2023 at Juhu Chowpatty. Through his workshop culture, self-respect, and bravery was inculcated in the children. This will help school students to remember the history of Chhatrapati Shivaji Maharaj through these replicas.

Using the sand on the Juhu chowpatty, the students created various eco-friendly Shiva castles without using any synthetic material (plastic, Plaster of Paris etc.).

Energy Conservation Drawing Competition.

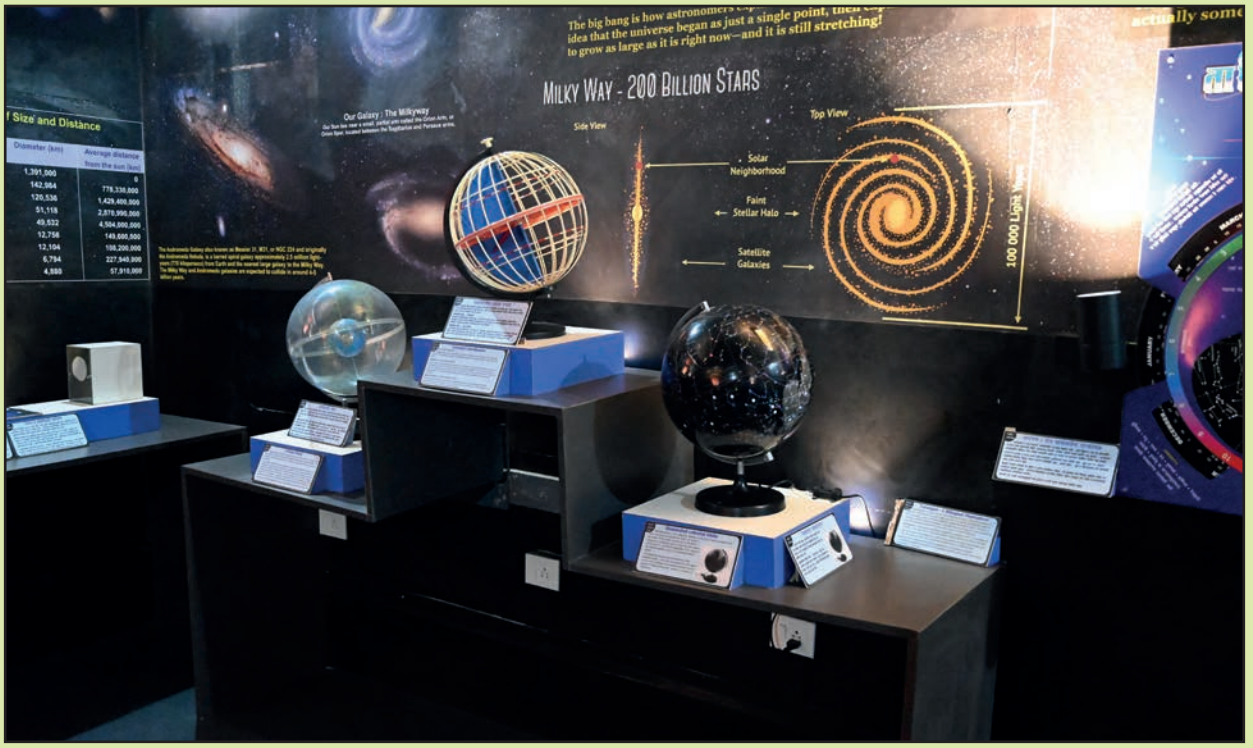
A large number of students from the Municipal Corporation's schools participate in the State Level Energy Conservation drawing Competition 2023 organized by the Union Ministry of Energy. In this, 04 students were selected at the state level.

WORK EXPERIENCE:

Various activities are taken to develop skills from work experience. Under the new education policy maximum emphasis has been laid on various vocation-oriented activities based on skill development. In this environmental protection awareness is created through compulsory activities, productive activities etc. Public awareness is created about water literacy and disaster management.

Keeping in view the available facilities and the interest and needs of the students, under the voluntary activities in the productive sector. Teacher Visit to Small Scale Industry Sector etc. is organized. Taking

consideration large use of plastic bags and its harmful effect on environment, making encouraged amongst parents and students.



19. AIR QUALITY STATUS

Air Quality Monitoring and Research Laboratory:

As per 74th ammendment of the constitution of India in 1992 (12th schedule) the Maharashtra State Government issued an ordinance amend Municipal Corporation Act-1888 making "environment protection, promotion of ecology and urban forestry" as an obligatory duty vide section 61 (ab) in the year 1994.

In view of fulfillment of the above Act, Air Quality Monitoring and Research Laboratory working under environment department of Brihanmumbai Mahanagarpalika to measure the levels of air pollutants in Brihanmumbai Municipal Corporation jurisdiction has established a fixed air monitoring station in different location. Also measured air pollution level with the help of automatic van (Mobile Van) in dumping ground and traffic junctions. Whenever the complaints are received from citizens, special monitoring is carried out and the reports are submitted. Also under the section '63 B' of Mumbai Municipal Corporation (MMC) Act. 1888 Environmental Status Report is prepared and submitted every year before 31st July to the Corporation. This laboratory established in the year 1976 this the only one environmental laboratory to monitored ambient air pollutant.

Air Quality Monitoring and Research Laboratory :

In the territory of BMC,. Ambient Air Quality Monitoring network comprises manually operated monitoring stations. From these monitoring station collects the samples of various pollutants with the help of High Volume Samplers like Sulpher dioxide (SO_2), Nitrogen dioxide (NO_2), Amonia (NH3) & Suspended Particulate Matter (SPM), temperature and relative humidity daily. These samples analysed with the help of UV Spectrophotometer. Along with this analysis of Polynuclear Aromatic Hydrocarbons (Phenanthrene, Anthracene, Fluoranthere, Pyrene, Benzo (α) anthracene, Chrysene & Benzo (α) Pyrene) extracted from suspended particulate matter are analysed with the help of Gas Chromatograph. Also the analysis of heavy metals [Arsenic (AS), Cadmium (Cd), Chromium (Cr), Copper (Cu), Iron (Fe), Nickel (Ni) & Lead (Pb)] extracted from suspended particulate matter are analysed with the help of Atomic Absorption Spectrophotometer. The Air Quality monitoring is carried out as per the CPCB guidelines. Whenever the complaints are received from citizens, special monitoring is carried out and the reports are submitted to concerns.

Mobile Van Monitoring Unit:

In the BMC area with the help of Mobile Van, monitoring is carried out at traffic junctions namely Wadala and Andheri. Similarly at the dumping grounds namely Deonar, & Kanjur. The pollutants analysed are SO_2, NO_2, CO, O_3, PM_{10}, $PM_{2.5}$, Hydrocarbans etc. Whenever the complains are received from citizens, special monitoring is carried out with the help of Mobile Van and the reports are submitted to the concern authority. Result of pollutants are compared with standards set by Central

Pollution Control Board (CPCB) and Monthly/Annual report is forwarded to Dy.Ch.Eng (Civil)Env/ Ch.Eng(SWM) and HOD, Environment Pollution & Research Centre(EPRC) department (KEM).

In the year 2022-2023, the Air Quality Monitoring and Research Laboratory,, Continuous Ambient Air Quality Monitoirng Stations have been operationalized at 5 places in the Brihanmumbai Municipal Corporation juridiction, through which Air Quality Levels, Air Quality Index etc. Information is becoming available to Mumbaikars. The Continuous Ambient Air Quality Monitoirng Stations are connected to the servers of Central Pollution Control Board and Maharashtra Pollution Control Board and daily Air Quality Index (AQI) information is displayed on the website of Brihanmumbai Municipal Corporation.

Table 19.1 :BMC's Continuous Ambient Air Quality Monitoring Stations

Sr. No.	Station	Address
1.	Byculla	Veer Jijamata Udyan, Byculla (E)
2.	Ghatkopar	New Pumping Station Ghatkopar, Eastern Express Highway, Ghatkopar(E)
3.	Shivaji Nagar	Shivaji Nagar BMC Hindi School No.2, Govandi (East)
4.	Kandivali	Charkop Maternity Home, Kandivali (w)
5.	Sewri	Sewri-Koliwada BMC School Complex, Sewri (East)

Table No.19.2 Air Quality Levels at CAAQMS sites (BMC) October 2023 to March 2024

	Center	Byculla					Ghatkopar					Kandivali					Sewri					Shivaji Nagar				
		PM_{10}	$PM_{2.5}$	O_3	CO	NO_2	PM_{10}	$PM_{2.5}$	O_3	CO	NO_2	PM_{10}	$PM_{2.5}$	O_3	CO	NO_2	PM_{10}	$PM_{2.5}$	O_3	CO	NO_2	PM_{10}	$PM_{2.5}$	O_3	CO	NO_2
1	Oct. 2023	116	54	66	0.5	39	131	73	61	0.9	34	135	34	26	1.5	15	138	59	63	0.8	37	189	76	53	0.8	48
2	Nov. 2023	120	69	45	0.7	53	110	67	53	0.5	27	187	75	33	0.7	31	146	77	51	0.9	48	198	87	59	0.7	59
3	Dec. 2023	124	66	42	0.9	32	126	73	48	0.6	25	210	75	29	0.9	38	164	87	46	1.1	61	234	98	52	0.9	73
4	Jan. 2024	89	50	29	0.8	15	107	53	34	0.5	03	96	61	18	0.7	26	117	62	42	0.9	63	197	73	29	1.1	28
5	Feb. 2024	82	46	46	1.0	46	117	50	06	0.7	39	105	71	12	0.9	30	114	60	16	1.3	76	247	84	21	1.3	96
6	Mar. 2024	68	22	53	0.4	18	104	34	15	0.3	103	63	36	21	0.4	24	83	32	28	0.6	44	98	41	33	0.8	68
	CPCB Std. Annual Avg	60 (µg / m^3)	40 (µg / m^3)	100 µg / m^3 (8Hrs)	2.0 mg / m^3 (8Hrs)	40 µg /m^3	60 (µg / m^3)	40 (µg / m^3)	100 µg / m^3 (8Hrs)	2.0 mg / m^3 (8Hrs)	40 µg /m^3	60 (µg / m^3)	40 (µg / m^3)	100 µg / m^3 (8Hrs)	2.0 mg / m^3 (8Hrs)	40 µg /m^3	60 (µg / m^3)	40 (µg / m^3)	100 µg / m^3 (8Hrs)	2.0 mg / m^3 (8Hrs)	40 µg /m^3	60 (µg / m^3)	40 (µg / m^3)	100 µg / m^3 (8Hrs)	2.0 mg / m^3 (8Hrs)	40 µg /m^3

Source :A.Q.M.&R. Lab (µg/m3)) – Microgram per meter cube, (mg/m3) – Milligram per meter cube

Obsevations :

1. Monthly average Levels of Suspended Particulates (PM_{10}) are found to be in the range of 63-247 µg/m^3 during October 2023 to March 2024. Maximum level of PM_{10} is observed at Shivaji Nagar (247 µg/m^3) in February 2024 .

2. Monthly average Levels of Suspended Particulates ($PM_{2.5}$) are found to be in the range of 22-98 µg/m^3 during October 2023 to March 2024 Maximum level of $PM_{2.5}$ is observed is observed at Shivaji Nagar (98 µg/m^3) in December 2023.

3. Monthly average Levels of Ozone (O_3) are found to be in the range of 06-66 µg/m^3 during October 2023 to March 2024. Maximum level of O_3 is observed at Byculla (66 µg/m^3) in October 2023.

4. Monthly average Levels of Carbon Monoxide (CO) are found to be in the range of 0.5-1.5 mg/m^3

during October 2023 to March 2024. Maximum level of CO is observed at Kandivali (1.5 mg/m^3) in October 2023.

5. Monthly average Levels of Nitrogen di-oxide (NO_2)are found to be in the range of 03-103 µg/m3 during October 2023 to March 2024. Maximum level of NO_2 is observed at Ghatkopar (103 µg/m^3) in March 2024.

Chart 19.2 (a) Air Quality Levels of PM_{10} & $PM_{2.5}$ at BMC CAAQMS - Oct. 2023 to March 2024

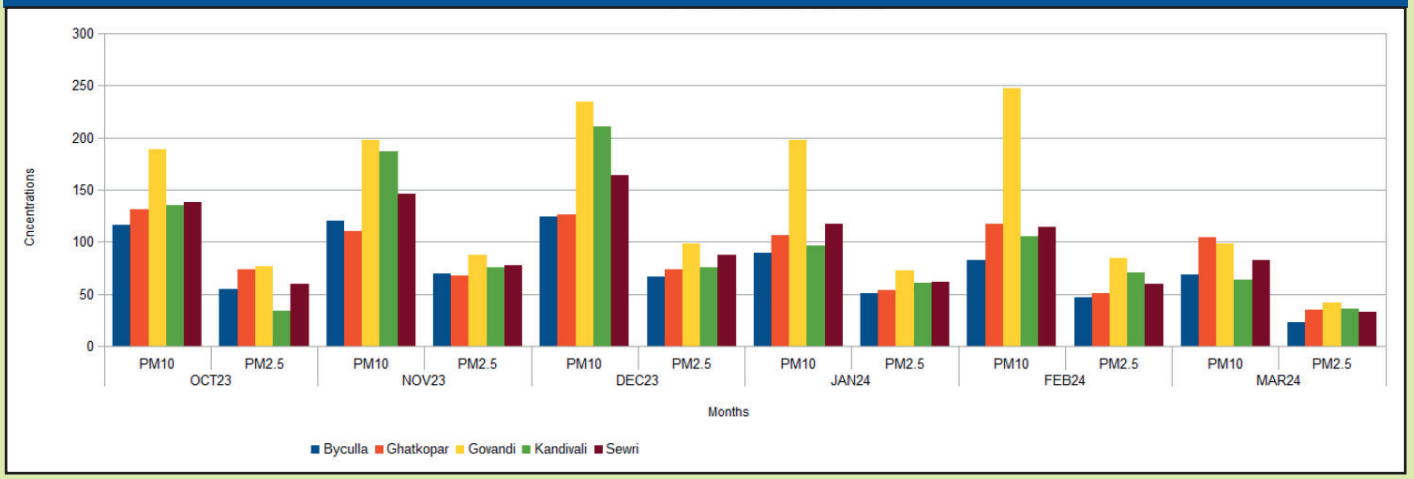


Chart 19.2 (b) Air Quality Levels of O_3 & NO_2 at BMC CAAQMS - Oct. 2023 to March 2024

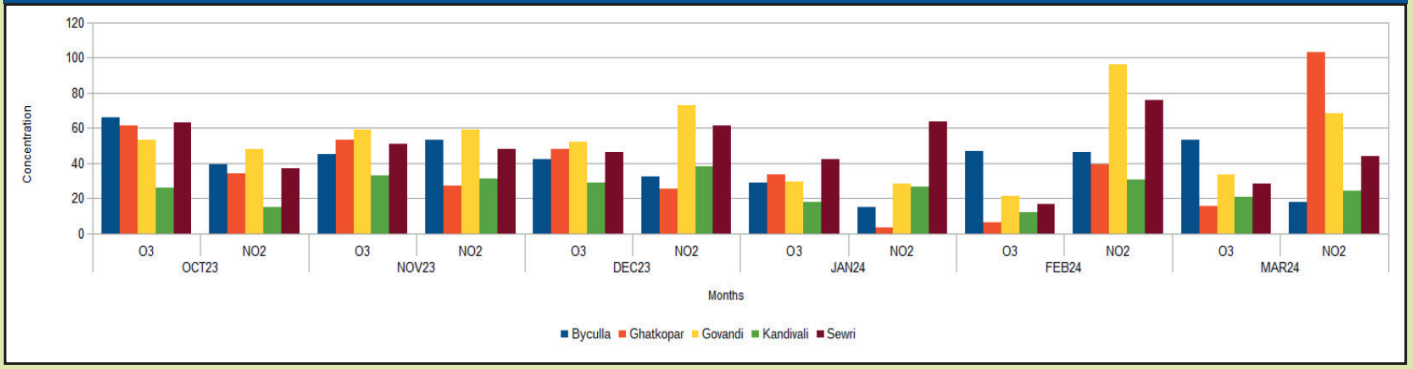
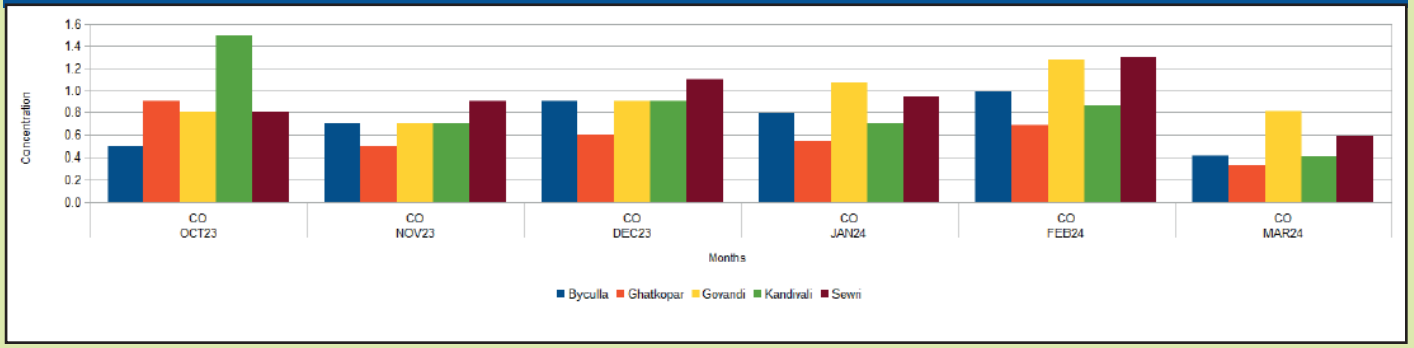


Chart 19.2 (c) Air Quality Levels of CO at BMC CAAQMS - Oct. 2023 to March 2024



The important project of SAFAR-Mumbai is a joint venture of BrihanMumbai Municipal Corporation (BMC) Indian Meteorology Department (IMD) Mumbai &; Indian Institute of Tropical Meteorology (IITM) Pune.Data received from 'SAFAR-Mumbai' is further analysed by Air Quality Monitoring and Research Laboratory for NO_2, CO, O_3, PM_{10}, $PM_{2.5}$ pollutants. Weather Forecast & Air Quality Index is now available to citizens on mobile app namely 'SAFAR-Air'

Air Quality Monitoring Stations (AQMS), Automatic Weather System (AWS) and LED Boards are installed at various locations in Mumbai to received information about current air quality and 1 to 3 days forecast.

Table No. 19.3: Air quality levels at "SAFAR-Mumbai" sites (2021 to 2024)

		2021-2022					2022-2023					2023-2024				
		PM_{10}	$PM_{2.5}$	O_3	CO	NO_2	PM_{10}	$PM_{2.5}$	O_3	CO	NO_2	PM_{10}	$PM_{2.5}$	O_3	CO	NO_2
1	Chembur	93	49	12	1.2	14	130	74	22	2.0	18	128	64	13	2.1	20
2	Bhandup	64	34	17	1.3	4	91	50	25	1.0	6	77	39	22	1.6	8
3	BKC	117	54	9	0.6	6	121	68	12	1.3	48	102	54	16	1.0	17
4	Colaba	121	61	28	0.7	10	92	51	28	1.0	9	83	45	27	1.5	14
5	Andheri	99	48	12	0.7	16	100	59	16	1.0	33	82	44	18	1.6	20
6	Malad	89	69	16	1.0	7	106	74	22	1.1	7	88	52	22	1.4	14
7	Mazgaon	108	76	20	0.4	13	94	59	18	1.4	45	84	40	18	1.5	22
8	Worli	53	33	22	0.6	5	68	41	24	1.0	22	83	39	23	1.3	12
9	Borivali	100	39	12	0.3	6	92	50	14	0.5	8	76	40	15	1.2	10
	Average	**94**	**52**	**16**	**0.8**	**9**	**99**	**58**	**20**	**1.1**	**22**	**89**	**46**	**19**	**1.4**	**15**
CPCB Std. Annual Avg		60 (µg / m³)	40 (µg / m³)	51 (8Hrs) (ppb)	1.75 (8Hrs) (ppm)	21 (ppb)	60 (µg / m³)	40 (µg / m³)	51 (8Hrs) (ppb)	1.75 (8Hrs) (ppm)	21 (ppb)	60 (µg / m³)	40 (µg / m³)	51 (8Hrs) (ppb)	1.75 (8Hrs) (ppm)	21 (ppb)

Source: 'SAFAR-Mumbai'
µg/m3:- Microgram per Meter cube ppb :- Parts per billion, ppm:- parts per million

Chart 19.3 (a) Air Quality Levels of PM_{10} & $PM_{2.5}$ at SAFAR-Mumbai CAAQMS - April 2023 to March 2024

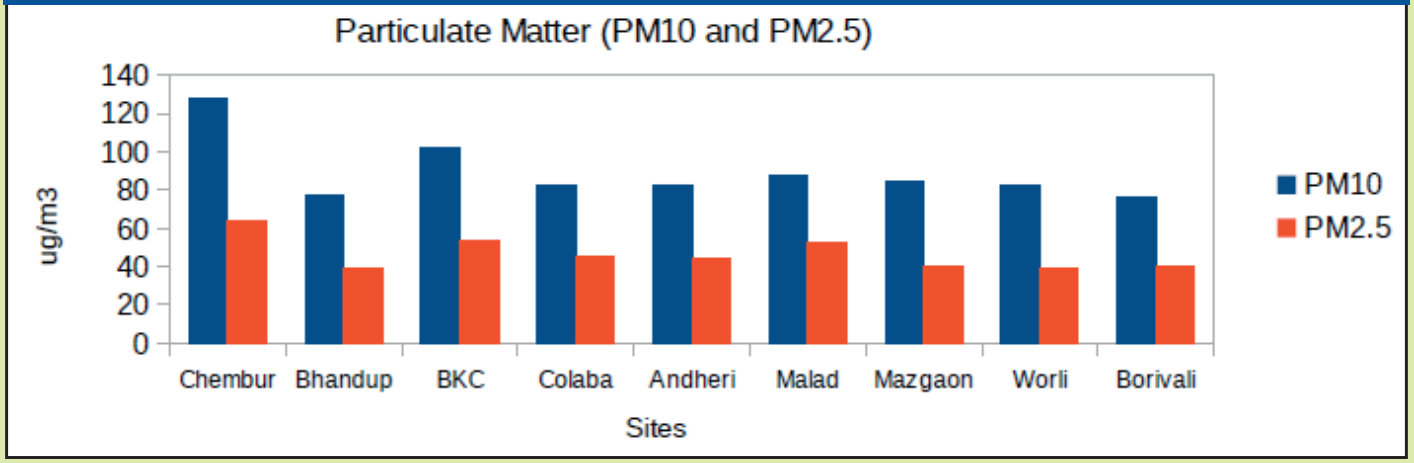


Chart 19.3 (b) Air Quality Levels of O3 & NO_2 at SAFAR-Mumbai CAAQMS - April 2023 to March 2024

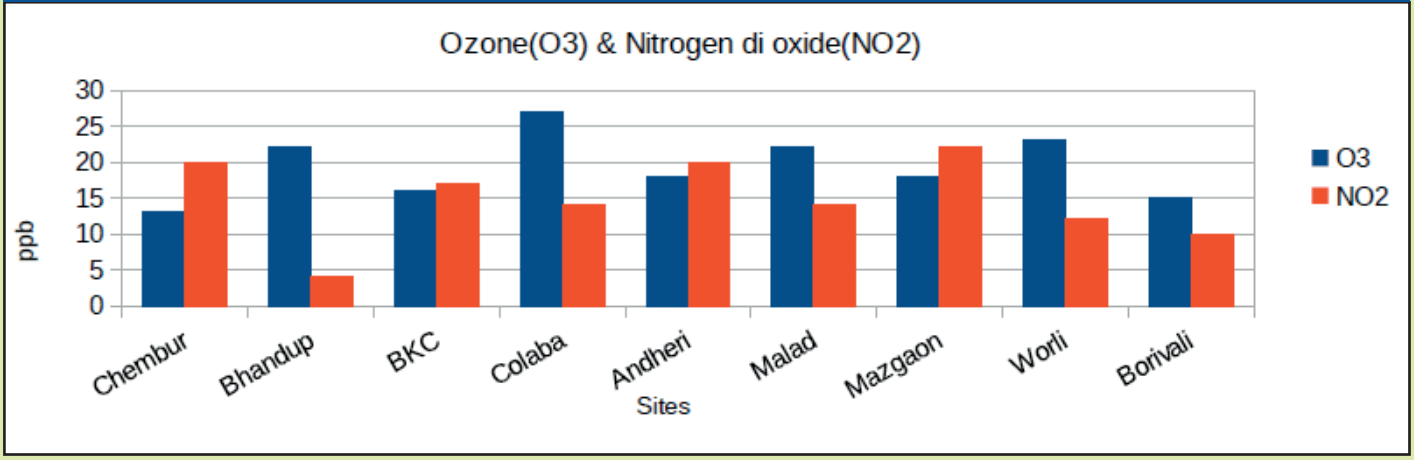
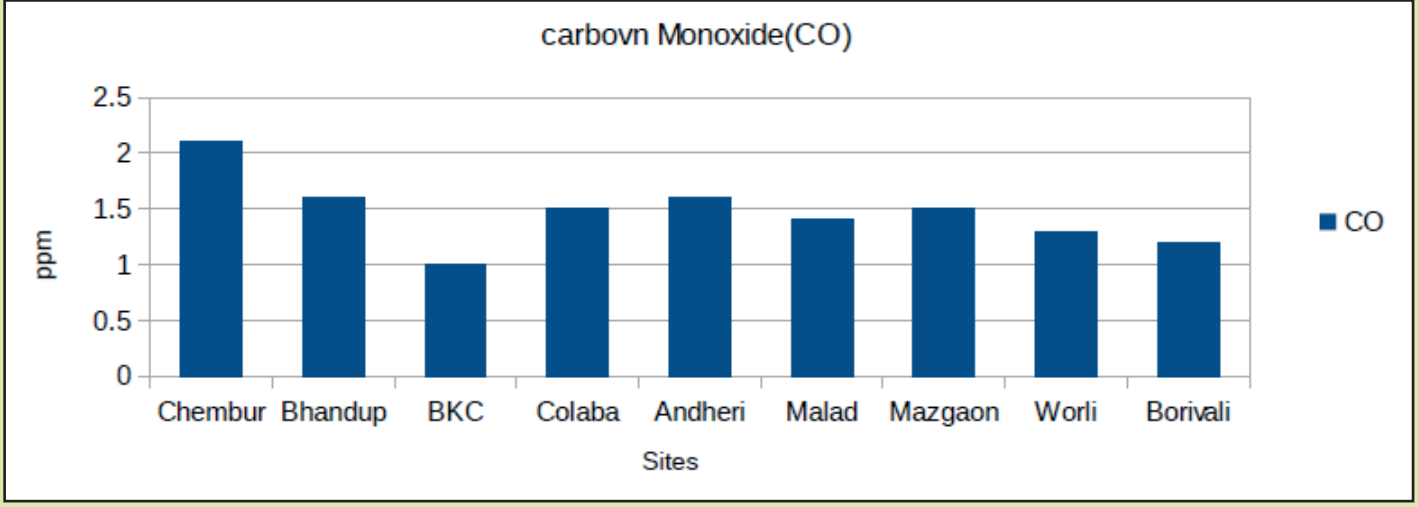


Chart 19.3 (c) Air Quality Levels of CO at SAFAR-Mumbai CAAQMS - April 2023 to March 2024



Annual Averages:

Comparison of annual levels with standards prescribed by Central Pollution Control Board observations is as follows; (Table No.19.3)

1. Levels of Suspended Particulates (PM_{10}) are found to be in the range of 76-128 µg/m3 during 2023-24. Maximum level of PM_{10} is observed at Chembur (128 µg/m^3) .
2. Levels of Suspended Particulates (PM2.5) are found to be in the range of 39-64 µg/m3 during 2023-24 Maximum level of PM2.5 is observed at Chembur (64 µg/m3).
3. Levels of Ozone (O3) are found to be in the range of 13-27 ppb during 2023-24. Maximum level of O3 is observed at Colaba (28 ppb).

4. Levels of Carbon Monoxide (CO) are found to be in the range of 1.0-2.1 ppm for the year 2023-24 Maximum level of CO is observed at Chembur (2.1ppm).

10. Levels of Nitrogen di-oxide (NO_2)are found to be in the range of 8-22 ppb during 2023-24 Maximum level of NO_2 is observed at Mazgoan (22 ppb).

Air Quality Index (AQI) :

Honourable Minister for Environment, Forests and Climate change, launched the national Air Quality Index (AQI) in New Delhi, on 17th September 2014 under the 'Swachh Bharat Abhiyan'. It is outlined as 'One number-One colour-One description' for the common man to judge the air quality in his vicinity.

The current measurement of index is made comprehensive by the addition of 5 more parameters to the existing 3 parameters, i.e. in total 8 parameters are considered. AQI is a tool for effective dissemination of air quality of that area to common person. The information provided on air quality is in simple linguistic terms that is easily understood by people. The AQI is calculated by comparing the measured ambient concentration of the pollutant to the National Ambient Air Quality Standards (NAAQS).

There are six AQI categories namely; Good, Satisfactory, Moderately polluted, Poor, Very poor and Severe. The categories are shown in following table.

Classification of AQI:

0-50	-	Green		Good
51-100	-	Light green		Satisfactory
101-200	-	Yellow		Moderately polluted
201-300	-	Orange		Poor
301-400	-	Red		Very poor
401-500	-	Brown		Severe

Monthly average Air Quality Index of Brihanmumbai Municipal Corporation's Continuous Ambient Air Quality Monitoring Station are shown in Table no. 19.4

Table No. 19.4 : Monthly Average Air Quality Index of BMC CAAQMS - Oct. 2023 to March 2024						
Sr. No.	Months	Monthly Average AQI				
		Byculla	Ghatkopar	Shivaji Nagar	Kandivali	Sewri
1	OCT. 2023	241	146	158	123	122
2	NOV. 2023	199	135	162	151	164
3	DEC. 2023	97	145	203	156	187
4	JAN. 2024	99	102	143	86	116
5	FEB. 2024	81	106	149	137	109
6	MAR. 2024	145	99	133	63	76

Chart 19.4: Monthly Average Air Quality Index of BMC CAAQMS - Oct. 2023 to March 2024

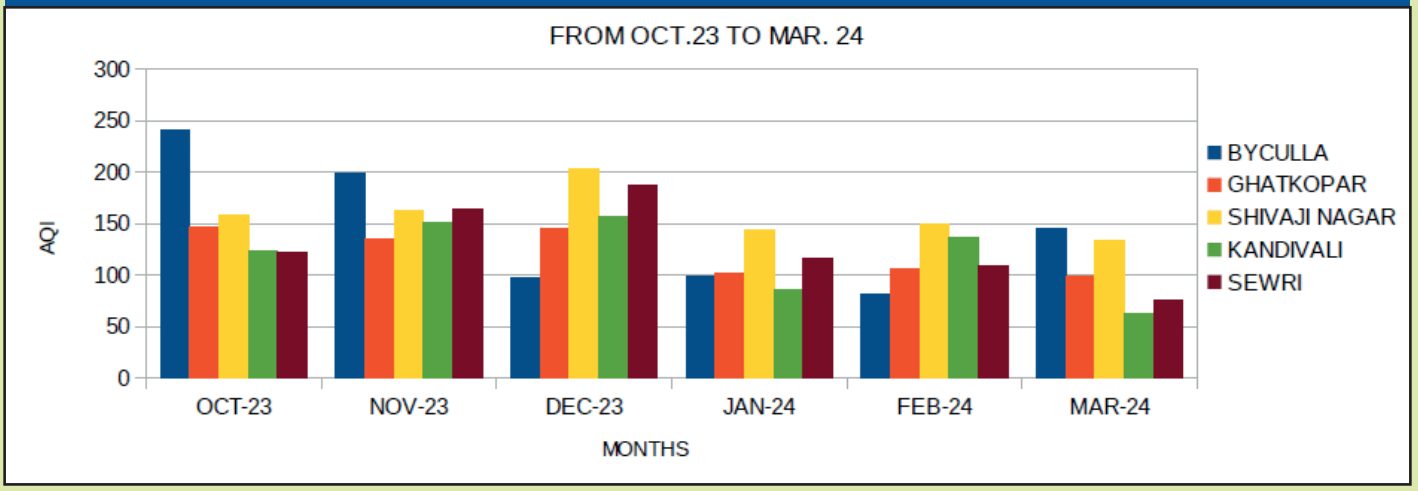
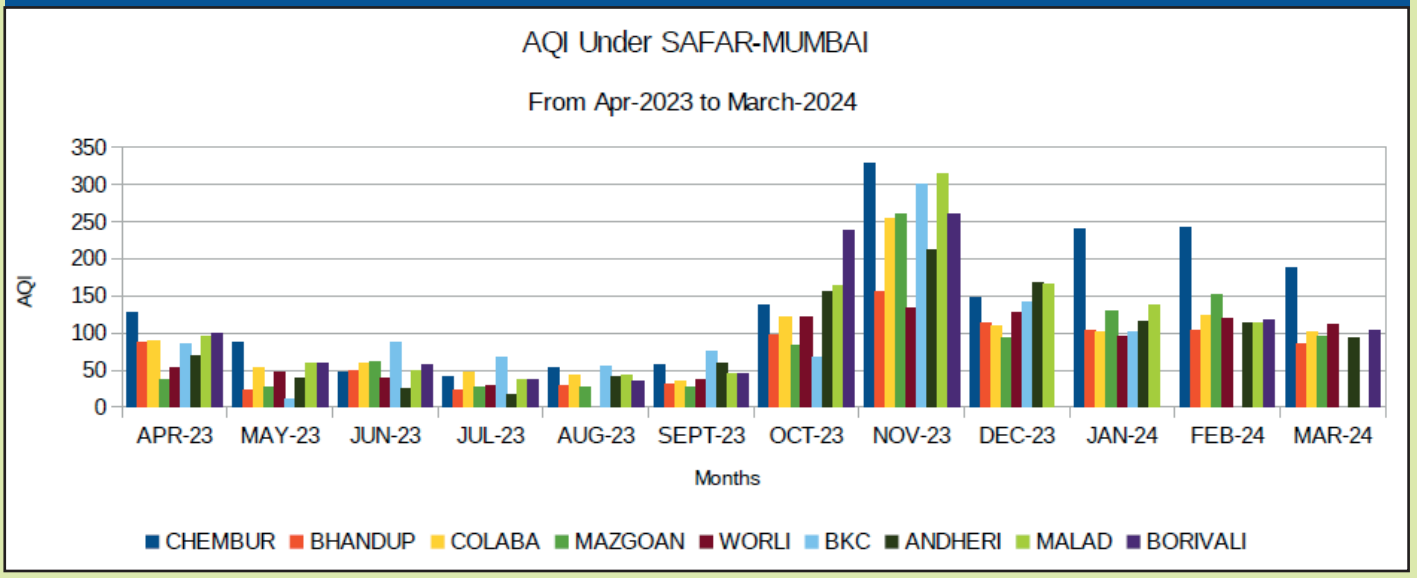


Table No. 19.5 : Monthly Average Air Quality Index Under SAFAR MUMBAI - April 2023 to Marh 2024

Sr. No.	Month	Chembur	Bhandup	BKC	Colaba	Andheri	Malad	Mazgaon	Worli	Borivali
1	April 2023	127	88	90	37	53	85	70	96	99
2	May 2023	88	24	52	26	47	11	39	59	60
3	June 2023	48	49	58	62	40	88	25	49	57
4	July 2023	41	22	48	26	30	67	17	38	36
5	Aug. 2023	53	30	35	28		55	41	43	35
6	Sep. 2023	57	31	35	28	38	75	58	45	46
7	Oct.2023	137	97	121	84	121	68	155	163	237
8	Nov. 2023	329	156	253	260	134	301	211	314	259
9	Dec. 2023	147	113	110	93	128	142	168	165	DNA
10	Jan. 2024	240	103	101	129	96	102	115	138	DNA
11	Feb. 2024	242	104	123	152	119	DNA	113	114	118
12	March 2024	188	86	101	95	112	DNA	94	DNA	104

DNA - Data Not Available

Chart 19.5: Monthly Average Air Quality Index Under SAFAR MUMBAI



Control of Air Pollution-Legal Aspects:

Municipal Commissioner has been vested with power as per MMC Act 1888, under sections 381, 390, 471, 472 to discharge certain obligatory and discretionary duties. MPCB is empowered to enforce the provisions of different Acts like Water Act, Environment Act, etc. Both agencies co-ordinates with each other to control pollution using these powers.

Table No.19.4: National Ambient Air Quality Standards central pollution control board, new Delhi (18th November, 2009)

Parameter	Exposure Period	Industrial, Residential, Rural & Other Area	Sensitive Area
Sulphur Dioxide, SO_2 µg/m³	Annual avg. *	50 µg/m³	20 µg/m³
	24 Hrs. avg.**	80 µg/m³	80 µg/m³
Nitrogen Dioxide, NO_2 µg/m³	Annual avg. *	40 µg/m³	30 µg/m³
	24 Hrs. avg.**	80 µg/m³	80 µg/m³
Particulate Matter (Size less than 10µm) PM_{10} µg/m³	Annual avg. *	60 µg/m³	60 µg/m³
	24 Hrs. avg.**	100 µg/m³	100 µg/m³
Particulate Matter (Size less than 2.5 µm) $PM_{2.5}$ µg/m³	Annual avg. *	40 µg/m³	40 µg/m³
	24 Hrs. avg.**	60 µg/m³	60 µg/m³
Ozone, O_3, µg/m³	8 Hrs.**	100 µg/m³	100 µg/m³
	1 Hr.**	180 µg/m³	180 µg/m³
Lead, Pb, µg/m³	Annual avg. *	0.5 µg/m³	0.5 µg/m³
	24 Hrs. avg.**	1 µg/m³	1 µg/m³
Carbon Monoxide, CO, µg/m³	8 Hrs.**	2.0 µg/m³	2.0 µg/m³
	1 Hr.**	4.0 µg/m³	4.0 µg/m³
Ammonia, NH_3, µg/m³	Annual avg. *	100 µg/m³	100 µg/m³
	24 Hrs. avg.**	400 µg/m³	400 µg/m³
Benzene, C_6H_6, µg/m³	Annual avg. *	5.0 µg/m³	5.0 µg/m³
Benzo alpha Pyrene, Particulate Phase only BaP, ng/m³	Annual avg. *	1.0 ng/m³	1.0 ng/m³
Arsenic, As, ng/m³	Annual avg. *	6.0 ng/m³	6.0 ng/m³
Nickel, Ni, ng/m³	Annual avg. *	20 ng/m³	2 ng/m³

Source: Central Pollution Control Board, New Delhi

* Annual arithmatic mean minimum 104 measurements in a year at a particular site taken twice a week 24 hrly at uniform interval.

** 24 hrly/ 8 hrly values should be met 98% of the time in a year, however, 2% of the time, it may exceed but not on two consecutive days.

NOTE:

1. National Ambient Air Quality Standard: The levels of air quality necessary with an adequate margin of safety, to protect the public health, vegetation and property.
2. Whenever and wherever two consecutive values exceed the limit specified above for the respective category, it would be considered adequate reason to institute regular/ continuous monitoring and further investigations.
3. The State Government/ State Board shall notify the sensitive and other areas in the respective states within a period of six months from the date of Notification of National Ambient Air Quality Standard.

20. INDUSTRIES

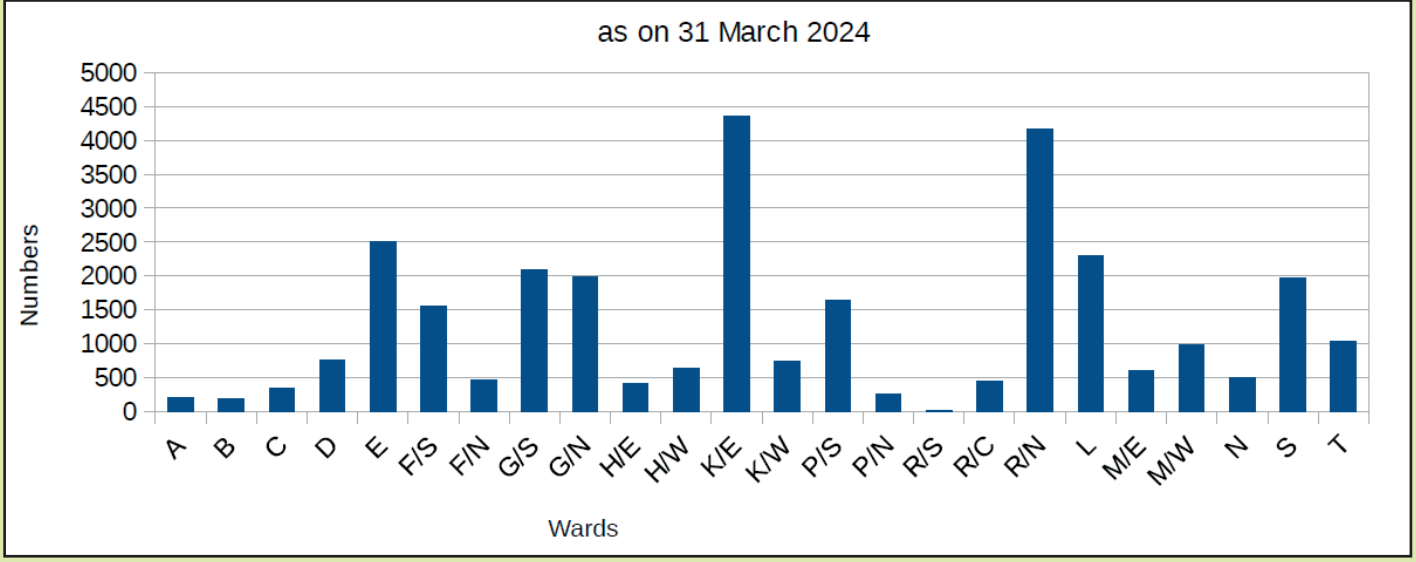
Environmental pollution is a by-product of industrialization. However, with the modern technologies, pollution potential of industries/factoroies are lowering. There are 30146 no. of industries are covered under section 390 of Mumbai Municipal Corporation Act 1888. These industries pay Air Pollution Prevention Fees on the basis of horsepower of the connected load. There are 10095 industries/factories are located in the city area, 12662 in Western Suburbs and 7389 in Eastern Suburbs. Maximum industries (4363) are in K/E ward. Ward-wise distribution of industries are shown in table 20.1.

Table No. 21.1: Wardwise Licensed Industries

Sr. No.	Ward	upto 31.03.2024	Sr. No.	Ward	upto 31.03.2024
1	A	210*	14	P/S	1640
2	B	191*	15	P/N	260
3	C	339*	16	R/S	5
4	D	750*	17	R/C	449
5	E	2511	18	R/N	4161*
6	F/S	1551	19	L	2292
7	F/N	466	20	M/E	1143*
8	G/S	2088	21	M/W	983
9	G/N	1989	22	N	927*
10	H/E	413*	23	S	1973
11	H/W	642	24	T	1031
12	K/E	4363	**Total**		**30146**
13	K/W	729*			

Source : Environment Department of BrihanMumbai Municipal Corporation
* Information from previous ESR 2022 - 2023

Chart No.: 21.1 Ward wise Licensed Industries



Ecofriendly Contribution of Industries

In addition to the efforts of Municipal Corporation of Greater Mumbai to reduced environmental pollution, other major industries in Mumbai also contribute in development of green cover in Mumbai and reduction in environmental pollution.

Rashtriya Chemicals and Fertilizers Limited

Rashtriya Chemicals and Fertilizers Ltd. have primary objective is to achieve a company that is more aware and responsible in the use of resources, its impact on the environment, its role in society and the community.

RCF Trombay Unit is accredited with ISO 9001:2015 (Quality Management System), ISO 14001:2015 (Environmental Management System), ISO 45001:2018 (Occupational Health and Safety), ISO 50001: 2018 (Energy Management System) and ISO 27001 (Information Security Management).

Sustainability is at the heart of RCF, and RCF continuously endeavoured to incorporate sustainability in every aspect of functioning. RCF presently is self- reliant in meeting its requirement of the precious resources of Water and Electricity.

RCF is operating two Sewage Treatment Plants (STPs) at Trombay Unit with each plant having

capacity to treat around 22.75 Million Litres per Day (MLD) of sewage received from BMC which otherwise would have been drained in to the sea after preliminary treatment. The STP plants treat waste sewage generated in the city and convert it into treated water. Both plants together generate about 30 MLD of treated water which is being used in our plants as process water. Both STP plants of RCF are of great value to residents of Mumbai and Society at large besides improving reliability of operations of RCF Trombay Unit. During the year 2023-24, about 8152.82 MLD of treated water was generated at both STP plants.

RCF has set up GT HRSG (Gas turbine with Heat Recovery Steam Generation) plants at Trombay\ units. With this process, RCF generates power required to meet its captive requirement.GT power generation for the year 2023-24 is 106235 Mwh. As part of achieving ecologically sustainable growth, RCF Trombay Unit has forayed into solar power generation. RCF Trombay Unit has set up a 2 MWp ground mounted Photovoltaic Solar power plant, in addition to this, commissioned solar rooftop facilities at Trombay. The power generated is used for captive consumption, thereby reducing power import to the equivalent extent. During the year 2023-24, 2316.087 MWh of solar power was generated. Also, during the year 2023-24, 3030 no of Solar Renewable Energy Certificates (RECs) were generated.

Green Belt Development at RCF Trombay Unit:

1. In the year 2023-24 total 9000 nos. of trees planted inside the factory, Township & near Admin area, namely Karanj, Kanchan, Satvin, Neem, Rain tree, FIcus, Palm tree, Bahava, Bakul, Tebubia, Badam, Chinch, Jamun, Vad, Kadamba, Ashoka, Sitafal, Avala, Taman, Guava, Kailaspati, Sapota etc.

2. Under the corporate social responsibility and create awareness regarding environment, RCF management have been arranged saplings distribution drive every year. This year total 5421 nos. of tree sapling were distributed to Lions club Mumbai, Shivam charitable trust, Satya sai seva organisations Mumbai, Mithul Enclave society Chembur, Pancharatna mitra mandal, chembur, Kalpavruksha Usha trust, Jagruti trust, CISF Kalina Chembur, S. Shetty shedung farm.

3. RCF Won the Six Different Trophies at Flowers, fruits, vegetable and tree exhibition 2024 organized by “MCGM Horticulture department” at Veermata Jijabai Bhosale Udyan and Zoo at Byculla, Mumbai from 2nd and 4th February 2024.

4. RCF won the Four rolling Trophies and Nineteen Trophies at 61st Annual vegetable, fruits & flower show 2024 organized by “Friend of the trees” at D.G. Ruparel college of Arts, Science and Commerce, near Senapati Bapat Marg,opp. Matunga Road Station (W.R.), Mahim, Mumbai 400016 from 10th and 11th February 2024.

Adani Powers

1] Power Supply and Consumption –

Adani Electricity is now India’s no. 1 utility company according to Ministry of Power's 12th Annual Integrated Rating and Ranking for Power Distribution Utilities, a report prepared by McKinsey & Company.

At Adani Electricity, we are dedicated to empowering individuals to live a sustainable lifestyle and make a positive impact every day. We aim to contribute to building a cleaner and greener environment with Green Tariffs while creating sustainable value and empowering India through #GrowthWithGoodness, in line with Adani Group's philosophy.

We also believe in providing customer-centric services through our innovative and advanced solutions. Our technology-driven value-added services, such as Smart Meters and Adani Electricity mobile app, have made it easier for customers to manage their accounts and access information about their energy usage digitally.

Established as a subsidiary of Adani Transmission Ltd, we are Mumbai’s leading power distribution utility company. With a distribution network spanning over 400 sq. Km of Mumbai city (nearly 85% in

terms of area), from Bandra to Bhayander on the western side and Sion to Mankhurd on the eastern side of Mumbai, we provide reliable power to over three million households. Adani Electricity meets close to 2,000 MW of power demand in Mumbai's largest and the most efficient power distribution network.

The company caters to around 3 million customers, with the residential segment forming almost 50% of power sales (in FY24) followed by commercial (~33%) and industrial (~12%) segments.

As an organization, Adani Electricity believes in the motto - The Power of Service. It is born of the will to make a difference and change things for the better, so that everyone can power their dreams and live a stress-free life.

AEML's Initiatives towards pollution control and reduction of carbon footprint:

- Fulfilling of RPO Obligations: AEML has fulfilled and significantly exceeded Standalone RPO target of 22% (MERC RPO Target) for FY 2023-24.
- 3711 MUs of renewable energy procured (~ 34.35% of total energy)
- Reduction in T&D losses from 5.93% to 5.47% (i.e., reduction in T&D losses by 0.46%).
- Reduction in GHG Emissions Intensity from 2254 (baseline FY18-19) to 1337 (reduction by 40.67%).

2] Renewable energy

- AEML plans to increase its renewable power procurement mix percentage to 60% by the end of FY 2027. Increased procurement of renewable energy from 3% (baseline FY19) to 34.35% in 4 years.
- AEML has entered into Power purchase Agreement (PPA) of 700 MW of hybrid power (solar + wind) with minimum guaranteed capacity utilization factor of 50%, from FY 2022 onwards, for 25 years.
- Green Energy Tariff - Launched Green Energy Tariff for supporting carbon neutrality goals of consumers. AEML offers consumers to opt for Green power (renewable power) voluntarily and provide with green energy certificates. Green power opted by 2808 consumers.
- AEML-D encourages and provide technical support to its consumers to install roof top solar plants through empanelled Roof top Solar PV Plant vendors. Cumulative installed capacity up to March 2024 is 39.51 MW. 1846 nos. of AEML Consumers have installed roof top Solar PV plant with net metering with 32 MU renewable energy generated in FY 2023-24.

- AEML installed grid connected 412kWp Rooftop PV Solar Plant in EHV substations and AEML offices to reduce use of conventional energy in offices / substations (2% of auxiliary power consumption from renewable energy in AEML offices & substations)
- AEML takes a significant step towards sustainability by installing a 100kW rooftop solar plant coupled with a Battery Energy Storage System (BESS). This innovative solution harnesses the power of the sun, reducing reliance on the grid and contributing to a cleaner, greener future. This pioneering project showcases AEML's unwavering commitment to environmental sustainability & responsibility.

3) Demand Side Management (DSM) Energy Conservation Initiatives –

- Embracing energy conservation initiatives is vital for a sustainable future. From adopting energy efficient technologies to promoting renewable resources, these initiatives improve economic efficiency. AEML being a customer centric organization taking energy conservation initiatives to contribute towards a sustainable future and improve customer's economic efficiency.
- Subsidy to consumers – AEML offers subsidy to its residential customers on purchase of energy efficient 5 Star rated ceiling fans and refrigerators etc. Resulting in savings of 1.28 million units (Mus).
- Urja Samvardhan Upakaram programme – 11 nos. of awareness sessions on energy conservation provided at Jalvayu Vihar, Our Lady of Nazreth High School & Jr. College, Gokul village, Shanti-park Society, ICFAI Business School, DIATREND jewellery (Andheri-E) etc. Around 600+ participants joined this program.

By implementing these initiatives, we are not only contributing towards a sustainable future but also saving costs. Through these collective efforts and awareness, we can foster a culture of efficient energy usage and save our environment.

4) Green Technology and Process Automation

- AEML has been continuously reinforcing and strengthening its commitment to the cause of Environment. Aligning with this commitment, AEML is already certified for Environment Management System (ISO-14001) and Energy Management System (ISO-50001). AEML has established a system to manage plastic / waste generated by establishing processes for Identification, classification, segregation, storage, reuse / recycle and disposal. AEML is now certified with Zero Waste to Landfill (ZWTL) and Single Use Plastic (SUP).
- AEML has carried out various automation processes to reduce use of paper and encourages all its consumers to opt for paperless bills for reducing environmental impact. Continued promotions for Initiative towards environment saving (890446 Consumers).

- AEML plans to replace entire existing fuel operated vehicles with electric vehicles. AEML procured 15 nos. of Electric vehicles till Mar'24 and deployed them for carrying daily operational activity across distribution area.
- AEML has replaced oil type switch gears with dry type maintenance free switchgears, and it also uses environmentally friendly Bio-degradable Ester Oil filled transformers to reduce environmental pollution.
- AEML has deployed Cold Shrink Joints in LT application in place of hazardous resin cast joints to reduce carbon footprint & hazardous waste.
- AEML has opted to use non-carcinogenic biodegradable silica gel in transformers across AEML distribution area.

5) Protecting cables while protecting the planet –

AEML jointly with FeelGood EcoNurture LLP develops a new style plastic cable covering using 100% post- consumer multi-layered plastics packaging waste (MLP). In addition to reducing the carbon footprint of the concrete blocks, MLP blocks are lighter and provide greater coverage. In addition, MLP blocks are economically viable and fully recyclable – thus promoting sustainability and environmental stewardship. The MLP-created plastic cable coverings provide Eco-friendly design, Efficient coverage, logistics optimization, cost effective and Environmental stewardship.

Hindustan Petroleum Corporation Ltd.

Mumbai Refinery has adapted following measures and best industrial technologies for minimizing environmental reductions:

1. HPCL-Mumbai Refinery is EnMS ISO 50001:2018 and ISO 14001:2015 certified.
2. HPCL produces and markets BS VI MS and HSD (Bharat Stage-VI fuels) which contain only 10 ppm sulphur which contribute towards lesser sulphur dioxide emissions that help in reducing air pollution towards reduction of carbon intensity in transportation sector.
3. Continuous Ambient Air Quality Monitoring Stations for monitoring Ambient air quality are installed inside industry premises for SOX, NOX, CO, PM2.5, PM_{10}, O3, NH3, etc. pollutants concentration monitoring. These stations also monitor BTEX and HC parameters in ambient air.
4. Installation of state-of-the-art technology Dual Optical Adsorption Spectroscopy (DOAS). This fence line system analyzes the ambient air quality along its path via Receiver to Emitter and is installed around North and West periphery of the industry.

5. Low sulphur fuel gas and fuel oil is fired to minimize stack emission. Low NOX burners are used in refinery heaters.
6. Flue gases from Fluidized catalytic cracking units are scrubbed into Flue Gas Scrubbing units which ensures reduction in SO2 and PM emission by 90%.
7. All process stacks are equipped with online real time monitoring analyzers which are connected with CPCB/SPCB servers, transmitting data in real time.
8. Refinery is having a state-of-the-art Effluent Treatment Plant (having API, TPI, DAF, SBR, MBR units) which is having VOC capture and treatment system for preventing air emissions and also have a dedicated STP unit for treatment of domestic effluent.
9. Petroleum storage tanks are complying to roof requirements as stated in MoEF and CC G.S.R. 186(E) dated March 18, 2008, for minimizing air emissions
10. Hydrocarbon flare is connected to recovery gas compressors for maximizing recovery of vent gases. Smokeless flare is deployed.
11. Leak Detection & Repair (LDAR) survey is carried out on quarterly basis for early identification and minimizing fugitive emissions.
12. Wastes are disposed off to authorized recyclers only. Plastic waste, E-waste, Batteries, Solid Waste Rules are being complied while disposal of these wastes.
13. Proper segregation and dedicated storage facilities are available for storing hazardous waste within premises while in transit for final disposal to CHWTSDF facility as approved by State Pollution Control Board.
14. Tree plantation drives are being carried out on periodic basis. Approx. 1000 tree saplings were planted using MIYAWAKI technique within the industry premises in FY 2022-23.
15. Refinery is having Occupational Health Centre (OHC) for monitoring health of employees handling refinery processes and records are maintained. Periodic health check-up of all the employees and contractors is carried out.
16. Promoting cleaner fuels such as LPG and maximizing distribution network to reach out to a greater number of households
17. Comprehensive Environmental Pollution Index (CEPI) study in Chembur area is facilitated by the industry.

18. Automated sweeper vacuum trucks are used for removal of road dust to minimize particulate matter emissions within the industrial premises.
19. Installed Solar Power generation capacity is 1080 KWp within the industry premises.
20. Approx. 1,63,608 kL Rain water harvesting carried out during the year.

Bharat Petroleum Corporation Ltd. Mumbai Refinery, Chembur

BPCL Mumbai Refinery (MR) has taken initiatives in Year 2023-24 for environment protaction. The status of these initiatives is mentioned below:

- As per the direction received from Maharashtra pollution control board, BPCL has provided 100 nos. of air purification units on BEST buses under CSR activity at Colaba Bus Depot.
- Mumbai Refinery recycled around 1187.6 thousand kilo-liters (TKL) of treated water in ARU cooling tower. Also, around 2182 TKL, of RCF STP water has been used in DM plant thereby reducing raw water consumption by 37.29%.
- Sewag Treatment Plant (STP) was installed at Refinery with capacity of 250 cubic metre per day (CMD) & has been in operation. In 2023-24, around 9000 KL treated water from SPT has been recycled to CPP cooling tower as raw water make up.
- Around 53 thousand KL of Rainwater was harvested in Monsoon period from jun to Sept. 2023 and the same has been used for cooling tower make up.
- Solar power plants has been installed at Refinary & Chembur Staff colony premises for harnessing solar energy. In the year 2023-24 solar power generated was 1441 MWh thereby leading to offset of GHG emissions by around 1153 MT.
- Real time Ambient Air Monitoring at AMS, stacks monitoring for SOX, NOX, CO & SPM, ETP outlet parameters for BOD, COD, TSS & pH with real time data transmission to CPCB/MPCB servers.
- Planted 2000 tree sapling of native species using MIYAWAKI method at NITIE College Mumbai.
- Zero Waste to Landfill (ZWL) 1st surveillance audit was carried out by M/s. Intertek. BPCL MR has achieved more than 99 % waste diversion from landfill.
- Bio-remediation of oliy sludge is being carried out using bacteria to reduce oil content below 0.5 % wt.
- Around 7544 m3 of biogas has been generated by processing 215.63 MT of organic waste from canteen.

- Flar Gas Recovery system (FGRS) was installed for emission reduction and energy conservation. Ultrasonic Mass flow meters are installed for continuous flare flow monitoring. In 2023-24, Flare gas recovery was total around 1727 MT which is around 9.6% of the total flaring thereby leading to reduction in scope- 1 GHG emissions by around 4928 MT.

21. HEALTH

Health is the level of functional efficiency of a living being. In layman terms, health usually means to be free from illness, injury or pain. The World Health Organization (WHO) defines health as a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity. To lead and enjoy a wholesome life one must have sound health.

Brihanmumbai Municipal Corporation largely takes care of citizen health through Health Care Services. The State Government, Private organizations and Private medical practitioners also contribute in the providing health care services. Health care is a primary the responsibility of Municipal Corporation of Greater Mumbai.

Table No. 21.1: Health Infrastructure 3-Tier System in MCGM

PRIMARY	Health posts	212
	Dispensaries	190
	Maternity Homes	29
SECONDARY	Peripheral hospitals	16
	Specialty hospitals	5
TERTIARY	Major hospitals (Medical & Dental colleges) (5 main hospitals and 1 H.B.T. hospital joint with Cooper hospital.	5

Source: Health Dept.

Environment contributes to the health of human being both in positive and negative ways. Better nutrition and clean environment will help to increase life span whereas, polluted environment will cause deterioration of health. Environmental hazards are responsible for as much as a quarter of the total of diseases worldwide and more than one third among children. Environment plays a major role in etiology of numerous diseases like water borne diseases (Gastroenteritis, Jaundice), vector borne diseases (Malaria, Dengue, Chikungunya) and non-communicable diseases like Hypertension, Diabetes, etc.

The health services are provided in two ways. There are hospitals, dispensaries and maternity homes all over the city catering to the medical needs of the people, while on the other hand there are Outreach Services. Under National Urban Health Mission 30 new health centers are started too. Objective of establishing health centers is to provide health service for implementation of family welfare program and outreach services for mother and child.

Table No. 21.2. It shows Birth & Death Rates and also Infant & Maternal mortality in the year 2021 to 2023. In Year 2023 Birth rate in Mumbai was 10.03/1000 population and the Death rate was 7.17/1000 population in the year 2023. Infant mortality rate was 21.69/1000 Live Births and Maternal Mortality rate 68.17/100000 Live Births for mothers.

Table No. 21.2: Health Statistics - Birth and Death Rates

	Year 2021	Year 2022	Year 2023
Birth (Registered)	113792	133805	130562
Birth Rate/1000 population	8.81	10.32	10.03
Death (Registered)	108113	94553	39255
Death Rate/1000 population	8.37	7.29	7.17
Infant Mortality	2601	2962	2832
Infant Mortality Rate/1000 live birth	22.86	22.14	21.69
Maternal Death	95	92	89
Maternal Mortality Rate/1000 live birth	83	68.76	68.17

Source: Health Dept.

Kasturba Hospital (Infectious Diseases):

Kasturba Hospital is located in the middle of City. It is largest Infectious Diseases hospital in the South East Asia, which admits patients of all the infectious diseases.

1) At this hospital, cases of infectious diseases i.e. Chicken-pox, Measles, Mumps, AFP, Hepatitis (A,B,C,E & other hepatitis), D/V, Typhoid Fever, Cholera, Dysentery, H3N2, Diphtheria, Whooping Cough, Fever, Meningitis, Malaria, Lepto & Dengue, Rabies, SARS, Ebola Virus Swine Flu & Covid 19 & newly emerging infectious diseases (except Tetanus, Tuberculosis Venereal Diseases & Leprosy) are isolated & treated. Cases of Plague & Cholera are compulsory transferred to this hospital.

Table No. 21.3 : April 2023 to March 2024

Sr. No.		Cases	Death
1	Dengue	1532	03
2	Swine Flu H1N1	52	01
3	Lepto	48	03
4	Malaria	1804	0
5	Covid 19	67	07
6	Measles	225	0

2) Kasturba hospital has well equipped 25 bedded Burns ward.

3) Kasturba hospital has 20 bedded Intensive Care Unit with Ventilators & other equipments.

4) Kasturba hospital has P.C.R. Lab well equipped with machinery to diagnose Covid-19, Lepto & Dengue,HIV, Viral load, Cholera, Early infant diagnosis of HIV, H1N1 and other infectious diseases. The Whole Genome Sequencing (WGS) test is also available.

5) Kasturba Hospital has 10 bedded Negative pressures isolated ward for admitting patients with different infectious diseases.

6) Three Oxygen Generation plants of 1080, 360 & 190 ltrs., per minute are available at Kasturba Hospital for management of critically ill infection diseases patients.

7) Kasturba Hospital has Hyperbaric Oxygen Therapy Department for management of head injury & Gangrene patients.

8) Central Analytical Laboratory is operational for quality testin of the drugs supplied to BMC at Kasturba Hospital .

9) Kasturba hospital has T.B. Lab for diagnosis of MDR TB patients.

10) It is proposed to start Bio Safety Level 3 VDRL Lab in Kasturba Hospital.

Group of Tuberculosis Hospitals Sewree :

Group of Tuberculosis Hospitals, Sewree of the Brihanmumbai Municipal Corporation is the largest hospital in Asia. Patients with drug sensitive and drug resistant (MDR-TB) disease come to the said hospital for examination, treatment and admission.

- Pulmonary Rehabilitation Centre was inaugurated by Hon. Add Municipal Commissioner (W/S) Mr. Suresh Kakani, Sir for the patients who are cured of Tuberculosis and given chest Physiotherapy. Up till now 3222 patients have been benefited.
- Alcoholic anonymous was started for T.B. Patients.
- Two Bio-Medical waste machines were installed to dispose Bio-Medical waste of the Hospital.

1. All the T.B patients with HIV infection are treated in ART centre which was started on 14th Aug 2020
2. 24x7 digital X-ray facility.
3. 02 Bedded IRCU is functional at present. In next 2 to 3 months planning to start 10 beded IRCU (intensive respiratory care unit)
4. Separate OPD for Drug sensitive & Drug resistance patients functioning 24x7. Separate ward for Drug sensitive & Drug resistance TB Patients.
5. Upgraded laboratory (TB containment lab) increased capacity of Gen-expert testing from 8 samples to 16 samples. Now it is upgraded and for 3 anti T.B drugs culture and sensitivity testing is done.
6. Sakas Aahar ie supplementary high protein diet for all GTB employees. To boost their immunity
7. Regular quarterly screening of GTB employee for detection of TB & other diseases like Diabetes & Hypertension.
8. Non communicable diseases clinic (NCD) is started for TB patients and their relatives.
9. GTB Hospitals premises has small & amp; large different trees also miyawaki garden. Therefore it helps in increasing oxygen level in atmosphere.

STATISTICAL INFORMATION YEAR WISE 2019 TO 2023		
YEAR	OPD(NEW/OLD)	ADMISSIONS
2019	31253	5500
2020	21637	3605
2021	22562	4157
2022	21939	4095
2023	20730	4200

10. Hospital premises has small & big almost 5 to 6 gardens, few of gardens are under beautification.

OPERATIONS			
YEAR	MAJOR	MINOR	TOTAL
2019	09	719	728
2020	00	523	523
2021	00	614	614
2022	00	769	769
2023	04	1071	1055

Acworth Municipal Hospital for Leprosy:

Mr. H.A. Acworth founded Acworth Municipal Hospital for Leprosy on 7th November 1890 the then Municipal Commissioner of Mumbai.

Since 1st April 1991, the hospital has been taken over by Brihanmumbai Municipal Corporation as one of the specialized hospitals under the administrative control of the Executive Health Officer.

Services provided by Acworth Municipal hospital for leprosy:

Acworth Hospital provides comprehensive care to the leprosy affected patients.

1) **Inpatient Service:** The current occupancy are around 40% and all patients are provided with Food, clothing and Shelter facilities. Apart from medical treatment for leprosy and other related ailments, rehabilitative and welfare services are provided to the patients.

2) **Outpatient Services:** Out-patient services include physiotherapy, social service, laboratory, dressing and pharmacy. Daily average OPD attendance is about 45 patients per day.

3) **Field Work:** Under National Leprosy Elimination Programme, hospital carries out IEC activities in its project area i.e. Brihanmumbai Municipal Corporation wards (F/South and F/North).

4) **Training:** The hospital provides training in leprosy to post-graduate and under- graduate allopathy and non-allopathy medical students as well as to student nurses, Social Science and O.T./ P.T. student. The hospital also offers training to Government Medical Officers, Non-medical assistants.

5) **Medical Records:** The hospital maintains statistical records and generates various reports thereby assessing the progress of N.L.E.P. in entire Mumbai.

6) **Collaborative Programme of Acworth Municipal Hospital and NGO's:**

   i) **Acworth Leprosy Museum:** Provides scientific information about all aspects of leprosy.

   ii) **Footware Unit:** MCR footwear, Splints are provided to the leprosy patients at concessional rates.

Table 21.4 Mumbai District Statistics 2023-24			
	2021-22	2022-23	2023-24
Total Leprosy Patients	335	626	602
MB patients among total patients	254	482	416
PB patients among the total patients	81	144	186
PR for Mumbai (Per 10000 population)	0.2	0.45	04

Table 21.5 Acworth Hospital Statistics 2023-2024	
Total Leprosy Patients in the Project area (E, F/S & F/N Ward)	84
MB patients among total patients	56
PB patients among the total patients	28
PR for AMHL (Per 10000 population)	0.5

Health Education:

Acworth Municipal Hospital provide health education at E, F/S and F/N Wards. Which helps to eradicate misconceptions about leprosy. On the occasion of death anniversary of Mahatma Ghandhiji from 31st January to 13th February, leprosy fortnight is arranged by this hospital every year. During this fortnight all active organizations effectively carry out public awareness and health education movement in their work premises.

Mumbai District AIDS Control Society:

Mumbai District AIDS Control Society (MDACS) registered under Charitable Trust Act is established by Brihanmumbai Municipal Corporation under the guiding principles of National AIDS Control Organization for prevention and control of HIV / AIDS in Mumbai. Currently National AIDS Control Programme-Phase V is being implemented in the country. Major responsibilities of MDACS are as follows:

1) Prevent the spread of HIV / AIDS for reducing annual new HIV infection and AIDS-related mortalities by 80% by 2025-26 from the baseline value of 2010.

2) To attain dual elimination of vertical transmission, elimination of HIV/AIDS related stigma while promoting universal access to quality STI/RTI services to at risk vulnerable population by providing care, support and treatment services to people living with HIV / AIDS (Infected and affected).

   Mumbai district AIDS control society provides services free of cost through below mentioned divisions.

Basic Services:

- Integrated Counseling and HIV Testing Centres (ICTCs) are established across the city in all Government / Municipal Hospitals / Maternity Homes. These services are freely available to all Walk-in / referred clients. Trained Counselors and Laboratory Technicians perform HIV Counseling and testing using standardized testing protocols with robust quality control.
- Early detection of HIV infection in pregnant woman is the mainstay of the program for preventing

the transmission of infection from infected mother to baby. For this, Multi Drug Antiretroviral treatment is initiated during first trimester of pregnancy.

- Early Infant Diagnosis: All infants born to HIV infected mothers are screened at 6th week after birth and regularly till 18 months for HIV infection.
- There are 246 ICTCs which includes 44 stand-alone ICTCs, 5 mobile vans and 197 Facility Integrated ICTCs, 7 Metro sites and also 1063 Private Nursing Home/ Corporate Hospital under Public Private partnership (PPP) providing facilities of counseling and HIV testing to ensure the access and availability of HIV counseling and diagnosis services.

Anti Retroviral Therapy (ART):

Treatment for HIV positive patients is made available through 20 ART Centres set up in various Hospitals in Mumbai. These centers are in 7 Medical Colleges, 6 Peripheral Hospitals, 5 are in public private partnership viz. Godrej, L&T, Wadia, K. J. Somiya and Mumbai Port Trust (MbPT) Hospitals, 2 in Brihanmumbai Municipal Corporation special hospitals (STD Clinic and TB Hospital). ART center for pediatric patients is operated through Paediatric Centre of Excellence, LTMG, Sion Hospital. Total 40498 patients living with HIV / AIDS are registered in active care of which 40481 patients are on lifelong treatment.

Blood Safety:

Preventing HIV transmission through infected blood by ensuring access to safe and adequate blood for the needy patients is one of the important services of MDACS. 24 Government, Brihanmumbai Municipal Corporation and Trust blood banks in Mumbai are supported by provision of trained manpower, HIV testing kits and grants. All the blood units collected in the blood units collected in the blood banks are tested for HIV, Hepatitis B, Hepatitis C and other blood born infections. Regular Voluntary Blood Donation Camps are organized in collaboration with Blood Banks and NGOs. Over the years, the number of voluntary blood donors has increased significantly reducing the risk of HIV infection through blood transfusion.

Sexually and Reproductive Health Services:

Unsafe sexual behavior leads to transmission of Sexually Transmitted Diseases (STDs) and HIV. STDs can be easily diagnosed and effectively treated by 'syndromic management treatment' approach. 27 designated STI/RTI clinics (DSRC) are set up in public health hospitals throughout the city with trained doctors and counselors who give treatment and counseling, condom promotion, partner notification and partner treatment. Effective management of STDs and counseling on responsible sexual behavior at STI clinics helps in prevention of HIV transmission. Regional STI training Reference Laboratory at B.Y.L. Nair Hospital is set up for etiological diagnosis of STIs.

Targeted Intervention:

Targeted Interventions are aimed at offering prevention and care services to high-risk groups viz Female Sex Workers, Men having Sex with Men, Transgender and injecting Dug Users. The bridge population of slum migrants and long distance Truckers are also provided with the information, means and skills to minimize HIV transmission. 36 Targeted Intervention projects under NACO Budget and BMC funded 1 Targeted Intervention project totaling to 37 Targeted Intervention projects are working through NGOs/CBOs who are providing prevention services including HIV/STI screening and treatment services to these high risk groups in the city.

Information, Education and Communication:

Various awareness campaigns are held using mass media, mid media and outdoor campaigns approach among youth, slum migrants and high risk groups for reducing risk behavior. Events are organized to increase the awareness among general population, especially for women and youth on various days viz. National Voluntary Blood Donation Day, National and International Youth Day, World AIDS Day, International Women's Day.

Present HIV/AIDS control Situation:

HIV positivity trend has witnessed a significant decline among the general clients (from 5.4% in 2011 to 0.64% in 2024) and Pregnant Women (from 0.36% in 2011 to 0.04% in 2024) in Mumbai.

Table No.21.6: HIV/AIDS Control Programme Report (F.Y. 2023-24)

HIV testing at Integrated Counseling and Testing Centers in Mumabi	Tested	Positive		Treatment for HIV positive patients at ART Centers in Mumbai	Adult	Children	Total
General Clients	518609	3299		Number of HIV Positive patients registered in active care	37652	1463	39115
Pregnant Women	210700	84		Number of HIV Positive patients on Anti-Retroviral Treatment (ART)	37628	1463	39091

Environmental Pollution Research Center (EPRC):

Seth G.S. Medical College & King Edward Memorial Hospital

Indoor environment is increasingly being recognized as a cause of disease and a potential area in which interventions can improve health outcomes. Environmental Pollution Research Centre established in year 1985 at KEM Hospital, affiliated to Department of Pulmonary Medicine has been

conducting community based respiratory morbidity assessment surveys. Census of population to be studied is done, followed by questionnaire survey, onsite clinical examination and pulmonary function

tests. Confounding factors responsible for respiratory morbidity such as personal habits including smoking or vaping are considered. Measurement of personal exposure is a major challenge in measuring the health effects of air pollution. EPRC has forayed into research into standardizing quantification of personal exposure. The unit conducts respiratory morbidity surveys on a large scale in the community.

Health education is a vital cog in the wheel of wellness. Educating citizens regarding the health effects of various pollutants enables greater and more efficient implementation of mitigation measures. Health education is equally, if not more important for patients with chronic respiratory disease. The unit caters to these patients by providing comprehensive education regarding mitigation measures related to outdoor and indoor pollutant and allergen exposure.

Surveys Done: 01 April 2023 to 31 March 2024			
Sr. No.	Date	Area	Total
1	12.4.2023	SURVEY VISIT ANDHERI	1
2	19.4.2023	WORLI AIRO ALLERGY SURVEY	15
3	26.4.2023	VISIT FOR PIGEON SITE VISIT 1.VIP SHOWROOM, PAREL 2.CHINCHPOKALI NEAR BY INCOME TAX OFFICE 3.VOLTAS HOUSE NEAR BY SBI BANK	3
4	2.10.2023	VISIT TO VILE PARLE FOR NEHP 1. NEHRU NAGAR ROAD NO. 5 2.ONGC COLONY 3.TRIVENI CHS 4.NANDANVAN FRIENDS CHS 5.LAXMINIVAS CHS	5
5	31.10.2023 to 20.12.2023	NEHRU NAGAR ROAD NO.5,VILEPARLE NEHP SURVEY AND AIR POLLUTION STUDY	464
6	01.4.2023 to 31.3.2023	ASTHAMA EDUCTION COUNSELLING	726
		TOTAL	1200

Pulmonary Function Tests: 01 April 2023 to 31 March 2024			
Total number of pulmonary function tests	PFT	DLCO	RVTLC
	2540	579	737

Arterial Blood Gas Analysis: 01 April 2023 to 31 March 2024				
	ABG	Electrolytes	Coox	Metabolites
Total Number of Arterial Blood Gas Analysis	67897	10391	10391	10391
TOTAL	**99070**			

Study evaluating the appropriateness of using global lung initiative equations for calculating predicted lung functions

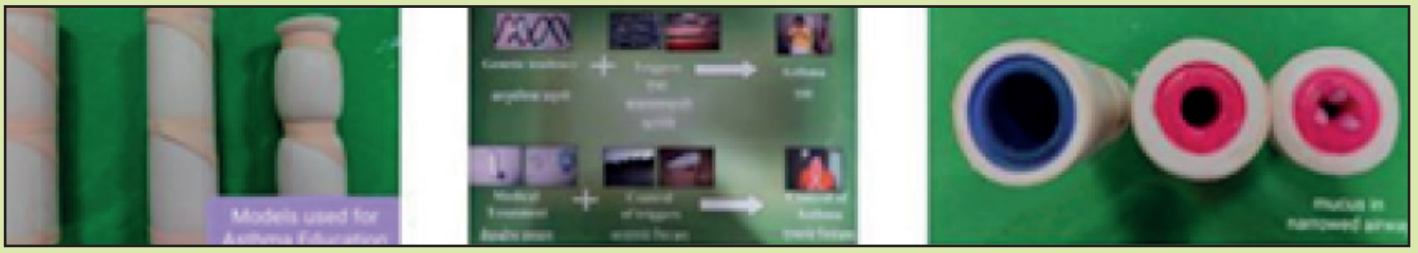
Interpretation of pulmonary function tests relies entirely on comparing the subject's lung function with a predicted normal. The equations for calculating the predicted normal have traditionally included race as a component. In 2012, the Global Lung Initiative (GLI) reported normative reference values derived from a global population that excluded Indians. A composite equation, an average of the four equations annotated GLI mixed, was provided to facilitate interpretation in individuals not represented by the four ethnic groups included. The recently published GLI global equations do not include race as a determinant of predicted lung function. In an observational study, we analyzed the impact of using GLI equations to interpret spirometry of 1,169 patients with chronic respiratory diseases, including asthma, chronic obstructive pulmonary disease (COPD), COPD suspects, small airway obstruction, post tubercular lung disease, and preserved ratio with impaired spirometry (PRISm) (46% females, average age 46 years).

We found that predicted normal and the lower limits of normal using GLI equations were significantly higher than those using Indian equations. The GLI race-neutral equations changed the category in 35.17% of males and 42.64% of females compared to Indian equations. The GLI mixed equations categorized a greater percentage of patients to have a mixed ventilatory pattern compared to the GLI race-neutral equations. There was a significant change in the grading of the severity of COPD using Global Initiative for Chronic Obstructive Lung Disease (GOLD) stages based on the percentage of predicted values of FEV1. GLI race-neutral equations substantially over diagnose abnormal ventilatory patterns on spirometry in adult Indians in western India with chronic respiratory disease. A substantial number of patients with normal or obstructive patterns on spirometry are recategorized to have mixed or restrictive patterns. The use of GLI race-neutral equations increases the severity of airflow limitation in COPD patients. Therefore, there is a need for establishing Indian standard equations at the earliest.

Factors affecting respiratory morbidity in suburban Mumbai

Questionnaire based studies are often subjective. Respiratory morbidity can be measured objectively based on pulmonary function testing. We analysed 805 subjects who had completed a questionnaire-based study. 33.2% subjects had exertional breathlessness, 2.3% had a symptom of chronic cough, 1.7% had chronic sputum production and 0.9% had wheezing. 61.2% subjects had no respiratory complaint. Of the 700 subjects who had acceptable spirometry, 45.2% subjects had normal lung function. Presence of indoor air pollution and lower per capita housing area increased the likelihood of chronic respiratory symptoms. Abnormal lung functions, however, were more likely in the elderly. A longitudinal study needs to be planned whether the cohort of patients with chronic respiratory symptoms who have normal lung function represent a population that shall benefit with early

intervention, maintaining normal lung functions with mitigation measures.



22. DISASTER MANAGEMENT

DISASTER MANAGEMENT AND CENTRAL COMPLAINT REGISTRATION DEPARTMENT:

The Disaster Management Department (DMD) was set up in 1999 at the Municipal Head Office managed disaster in Mumbai. Department is upgraded with modern equipments situated on second floor in Brihanmumbai Municipal Corporation Head Office.

District Disaster Management Authority:

In the year 2011 Greater Mumbai Disaster Management Authority was constituted in exercise of the powers conferred by Sub-sections (1), (2) and (4) of section 25 of the Disaster Management Act, 2005 (53 of 2005) and rule 2 of the Maharashtra District Disaster Management, by appointing Municipal Commissioner of Brihanmumbai Municipal Corporation as Chairman of the Authority.

In the year 2018 as per the Government Resolution followed by the orders of the Hon'ble High Court the Districts Disaster Management Authority for the Mumbai City and Mumbai Suburban are constituted. Senior Most Additional Municipal Commissioner for Mumbai City and Mumbai of Suburban of Brihanmumbai Municipal Corporation are appointed as ex-officio Chairman of the District Disaster Management Authorities.

Disaster Management Control Room

Functions of Disaster Management Department:

1. Single – point source for all issues related to disaster management.
2. Hazard Vulnerability and Risk Assessment

3. Prevention and Preparedness
4. Coordinate with relevant agencies for reducing the severity of damage.
5. Response
6. Coordinate with relevant agencies for help and rehabilitation.
7. Command and Control agency between administration and field units.
8. Coordinate for early warning to citizens.
9. Coordinate for arrangement of food and water during emergency situations.
10. Coordinate the transportation of stranded and injured people during disastrous situation.
11. Coordinate for the transportation of critically injured people on high priority.
12. Coordinate for setting up temporary shelters.
13. Coordinate with NGOs.

Objectives of Disaster Management Department:

1. Coordinate for rapid and effective response during any disaster.
2. Improve coordination among all the responding agencies.
3. To utilize social media through Public Relation Office for disseminating disaster related information among citizens.
4. To encourage preparedness on every level.
5. To encourage for helping disaster affected people.
6. Impart Training to the Citizens and stakeholders.

Emergency Operations Centre (EOC):

The Disaster Management Department works 365 days x 24 hours throughout the year. It serves as a Command and Control agency between the administration and field units. It is a single-point source for all issues related to disaster management. It coordinates with various stakeholders for quick and effective response during a disaster.

1. Direct telephone line facility.
2. Television sets which are tuned to major news channels to keep abreast of the latest news.

3. In case of interruption in communication system HAM radio is used as alternative communication system.
4. '1916' helpline with 30 hunting lines are available for Citizens registered complaints related to major/ minor accidents, fire, earthquakes, bomb blast etc.
5. 24 Administrative ward control rooms, Back Up Control Room, 3 major and 2 peripheral hospitals and 28 outside agencies are connected with 58 hotlines provides regular updates about the situation in the Mumbai City and suburbs.
6. For monitoring disaster management activities a video wall of size 6200 mm long and 1744mm height has been installed. Video wall receives feed from 5361 CCTV cameras installed by Mumbai Police.
7. DMR is an advance communication system implemented by DM dept in January 2022. This system is installed in 24 ward control rooms, 37 stakeholders and on vehicles of designated Brihanmumbai Municipal Corporation officers. Total 326 DMR sets installed. This system has advance features like Broadcast Call, Emergency Call, Pre Recorded Messages, Intelligent Audio, Blue Tooth / Wi-Fi, Man Down and Loan Worker, Secured Encrypted Voice Communication, Better Spectrum Efficiency, Integrated Voice and Data (Speech to text and text to speech), Double Capacity Per Frequency Spectrum, Longer Battery Life, Facility for Group Call, Individual Call, Enabling Data Application viz. Dispatcher, GPS Location Tracking, Geo Fencing, Data and Voice Logger, Over the Air Programming, Text Messaging, etc.

The following types of complaints are registered in Disaster Management Department:

32 types of manmade and natural disasters are identified which are likely prone to Mumbai City and Suburbs which is categorized into 102 sub-major disasters like major/ minor accidents, landslides, felling of trees or unauthorized cutting of trees, water logging, house collapses, short circuits, floods, earthquakes, bomb explosions etc. On registration, these incidents are communicated to the concerned agencies for providing necessary assistance.

Automatic Weather Stations (AWS):

- 60 Automatic Weather Stations have been installed in Mumbai to get real time weather parameters.
- Weather Parameter data is refreshed after every 15 minutes.
- The data is monitored, analyzed and the warnings are issued accordingly.
- Flow Level Sensors are installed to monitor water level in rivers and lakes. It gives real time information in Disaster Control Room.

- This will help to initiate early evacuation action low lying areas in the vicinity. Flow Level Censors are installed at Dahisar, Poiser, Wakola, Mithi, Oshiwara rivers and Powai, Vihar Lake.

Disaster Management Website:

The website 'dm.mcgm.gov.in' shows following information: High Tide-Low Tide time table, Weather forecast obtained from India Meteorological Department, Live weather parameters updated every 15 minutes, Traffic updates, Status of Local Trains, Status of Air Traffic etc.

Disaster Management App:

Disaster Management Department, Brihanmumbai Municipal Corporation launched a new android phone application to aid in citizens response to disaster management and control. The app, Disaster Management Brihanmumbai Municipal Corporation, will provide real time information of whether parameters as well as help available at hand within a radius of 500 meters from the distressed person.

Though the application, on clicking on a landmark in the vicinity of the crisis, the app will automatically generate a list of police stations, hospitals, fire brigaded station and numbers of ward offices within a radius of 500 meters.

The app will also allow the user to save emergency personal contacts in a separate list in the app and calls to numbers will be made through the app in the person chooses to notify the contacts of the disaster.

Emergency Support Functions (ESF):

- 14 Emergency Support Functions have been identified as an integral part to carry out emergency response activities, including preparedness, response during the event, and immediate recovery.
- In the events of major disaster or emergency where quick response is required, the lead agency will take action as per SOPs and work in coordination with the support agencies and other ESF's to mobilize and deploy resources to the affected area in Mumbai.
- In peace time, each ESF Plan and prepare for emergencies through review of the planning assumptions, drills, table top exercises and preparation and reviews of the Standard Operating Procedures.
- Preparedness and planning activities are essentials to ensure adequate response and to identify areas of actions that would ultimately reduce disaster risk.

GIS based Command and Control System:

Disaster Management is shifting form reactive to proactive nature and approach. Therefore risk reduction before disaster is really very important aspect in modern days.

It has been also learned from the previous disasters that, prediction, early warning are also playing vital role in disaster management along with prevention, mitigation, preparedness, planning, relief and rehabilitation. GIS based technology provides best platform for development of such system. GIS has emerged as an effective tool in disaster management since GEO spatial data and socio economic information needs to be amalgamated for the decision making and in handling a disaster or to plan for tracking disasters in scientific manner.

Disaster Management Control Room

Prime objective of developing GIS is to help DMD for:

1. Prediction and Early Warning
2. Risk reduction, planning and preparedness in pre-disaster phase
3. Decision Support System
4. Damage Assessment and Relief Management

GIS combines layer of information on various themes to enable DMD to take the most appropriate decisions under given circumstances.

1. DMD generate maps both at macro and micro level indicating vulnerability at different extends under different threats perception.
2. Locations likely to remain unaffected or remains comparatively safe could be identified.
3. Alternated routes to relief camps and important locations in the event of disruptions of normal surface communication could be worked out.
4. Smooth rescue and evacuations operation can be properly planned.

City Institute of Disaster Management and Research Centre (CIDM):

If main EOC at MHO is breaks down due to any reason, a backup control room has been setup at CIDM, Parel for continuous coordination. This backup control is equipped with Hotlines, Wireless communication, HAM Radio, Video Wall, ESF etc. similar to EOC at MHO. CIDM provides comprehensive training on disaster management and first responder to employee of Brihanmumbai Municipal Corporation/ Government/ Private companies, School and College students, Medical practitioners,

Police etc to aware them about scientific methods of disaster management.

In case of any mishap happens at Brihanmumbai Municipal Corporation Head Office and Emergency Operations Center at 2nd Floor is not accessible or cannot be operated a backup control room has been setup at CIDM, Parel. This backup control is equipped with Hotlines, Wireless communication, HAM Radio, Video Wall, ESF etc. similar to EOC at MHO. CIDM provides comprehensive training on disaster management and first responder to employee of Brihanmumbai Municipal Corporation/ Government / Private companies, School and College students, Medical practitioners, Police etc to aware them about scientific methods of disaster management.

3D Auditorium and an Art gallery is developed to show realistic information about of various disasters. The major objective of these facilities is to make visitors aware of disaster and its preparedness. In this Art gallery has interactive dioramas, display, photographs and information boards for awareness generation of various disasters.

Post Graduate Diploma in Disaster, Fire and Industrial Safety Management (PGDDFISM):

Considering the importance of Disaster Management and ever increasing impacts of Disasters in future, CIDM has commenced a one year PGDDFISM course in coordination with GICED and Mumbai University. This course offers scientific learning of concepts of natural and manmade disaster and techniques of every stage in DM. The Primary aim of this course is to educate personal from Government agencies, industries regarding appropriate response to the impending disaster and reduce the impact on mortality and economy.

City Disaster Response Force (CDRF):

On the basis of National Disaster Response Force (NDRF) at National level and State Disaster Response Force (SDRF) at State level, a City Disaster Response Force (CDRF) is establish at City level for Mumbai. The objective of formulating CDRF for Mumbai is to develop self sustainability for responding disasters like major fire, collapse structure, Chemical-Biological-Radiological-Nuclear etc. The personnel appointed for CDRF are from existing Security Force, Mumbai Fire Brigade, Doctors and Paramedics of BrihanMumbai Municipal Corporation are trained by National Disaster Response Force (NDRF).

Central Complaint Registration System (CCRS):

On-line complaint management system (CPWM Module) has been started from year 2000 to register civic complaints. Central Complaint Registration System is working 24X7. Civic Complaints pertains to Brihanmumbai Municipal Corporation are registered on phone no.1916 in the central control room and sent to the concerned department through online system. Citizen can lodged their complaints on line on Brihanmumbai Municipal Corporation portal i.e. http://portal.mcgm.gov.in

Un-attempted complaints are automatically escalated to higher authorities such as Assistant Commissioner- Dy. Municipal Commissioner to Additional Municipal Commissioner and finally to Municipal Commissioner in a time bound manner.

23. BRIHANMUMBAI MUNICIPAL CORPORATION PUBLIC RELATIONS DEPARTMENT

Brihanmumbai Municipal Corporation (BMC) is actively addressing the impact of global climate change and various types of pollution observed in the Mumbai Metropolitan City. In response to challenges like water, air, and other forms of pollution, BMC implements long-term sustainable measures. BMC's Public Relations Department plays a crucial role in showcasing the municipal administration's positive efforts towards environmental protection and conservation. The work of environmental awareness has been done vigorously through various channels including traditional media, social media platforms, and other mediums.

In the year 2023-24, the civic body conducted significant environmental initiatives. These include efforts to control air pollution through the framing of guidelines and Standard Operating Procedures (SOPs), as well as the formation of task forces at the ward level to take action against violators. Public Relations Department worked tirelessly to communicate these efforts to the citizens of Mumbai. Project activities, events, developments, civic services & amenities provided by the municipal administration were extensively publicized through various language newspapers, news channels, and social media platforms with a focus on environmental interests. Throughout the year, Public Relations Department issued a total of 730 newsletters and press releases, out of which 88 were related to environmental activities & awareness. Using various means of publicity, press notes along with photographs, audio-visual clips, the department ensured comprehensive coverage of these initiatives in all sorts of media.

Pollution Control Measures in Mumbai-

The municipal administration held regular meetings to address air pollution control, implementing Standard Operating Procedures (SOPs), and establishing task forces at the ward level to take strict action against violators. These efforts were consistently documented and disseminated to the public. For instance, BMC issued guidelines for air pollution control in Mumbai, appointed marshals, took action against gold and silver smelting units contributing to air pollution, imposed penalties on violators of air pollution control regulations during debris transportation, introduced vehicle-mounted anti-smog machines, and launched the Mumbai Air mobile application for reporting air pollution-related complaints. These are a few examples of press releases.

Eco-friendly Ganeshotsav-

Ganeshotsav is a significant festival in Mumbai, and BMC is striving continuously to promote eco-friendliness during the celebration of the festival. During the year various press notes were disseminated urging citizens to opt for eco-friendly shadu clay idols and use artificial immersion sites for idol immersion, highlighting the importance of collecting floral offerings at immersion sites (nirmalyasankalan) in order to improve waste management.

Deep Clean Drive-

To address air pollution and enhance public health in the City of Mumbai, the municipal administration has launched a 'Deep Clean Drive' since November 2023. This initiative prioritizes dust control through the deployment of additional manpower and machinery across Mumbai. The intensive cleaning drive covers main roads, footpaths, narrow lanes, residential areas, beaches, koliwada, and other public spaces etc. The Public Relations Department plays a vital role in raising awareness about this drive through press releases issued along with photographs and videos. Dignitaries such as the Hon'ble Chief Minister, Hon'ble Guardian Minister, and Hon'ble Municipal Commissioner have also participated in this drive, further amplifying its visibility. All these efforts are being given wide publicity.

Mithi River Project-

The project with a capacity of 80 lakh liters per day has been commissioned to improve the water quality of Mithi River. This initiative aims to enhance the biodiversity of the Mithi River, leading to positive environmental impacts. The Public Relation Department has actively publicized the initiative.

Environment -Friendly Initiatives by the Garden Department-

The Garden Department of the BMC functions to maintain and preserve green spaces at public spaces in Mumbai. The Public Relations Department ensures that these efforts are communicated effectively to the citizens. Initiatives such as providing horticulture knowledge to students at gardens, planting 25,000 trees at various locations in Mumbai, planting 200 trees of local species during the urban afforestation campaign on Environment Day, an appeal refraining from cutting trees during the Holi festival, and unveiling the Greening Mumbai booklet for tree conservation were actively promoted to engage the community, stakeholders, and raise awareness amongst the citizens of Mumbai.

Action against Plastic Usage-

Plastic poses a significant threat to the environment, and the municipal administration is working hard to limit the use of single-use plastic & prohibited plastic. The action taken by flying squads against violators was given publicity to encourage all stakeholders to refrain from using plastic.

Other initiatives -

In 2023-24, various environmental activities were provided with significant publicity, viz. The Chief Minister's Swachh Mumbai Helpline to report instances of garbage burning at open spaces, the availability of mobile toilets on beaches, the introduction of scientific and eco-friendly cremation facilities for pets in Malad, and the installation of eco-friendly sanitary napkin vending and incinerator machines in over 200 public toilets in Mumbai. Additionally, the initiative for promoting eco-friendly, green, and pollution-free Diwali celebrations was highlighted. All these activities were communicated to citizens through press releases and creatively utilizing social media platforms. Under initiatives such as the Government of Maharashtra's 'MajhiVasundharaAbhiyan3.0', 'SwachhSurvekshan2023', and 'SwachhVayuSurvekshanAbhiyan', awareness was raised among citizens to encourage fireworks-free, plastic-free, garbage-free, pollution-free, and eco-friendly festivals.

Besides press releases, the Public Relations Department also provides detailed & factual clarifications on any misinformation published in the media. This proactive approach helps in upholding the image of the municipal administration by ensuring that accurate information reaches the citizens. These clarifications cover various topics, including environmental issues, and play a crucial role in addressing misconceptions.

24. MAHARASHTRA POLLUTION CONTROL BOARD

Maharashtra Pollution Control Board (MPCB) is implementing various environmental legislations in the state of Maharashtra, mainly including Water (Prevention and Control of Pollution) Act, 1974, Air (Prevention and Control of Pollution) Act, 1981 and some of the provisions under Environmental (Protection) Act, 1986 and the rules framed there under like, Biomedical Waste (M&H) Rules, 1998, Hazardous Waste (M&H) Rules, 2000, Municipal Solid Waste Rules, 2000 etc. MPCB is functioning under the administrative control of Environment & Climate Change Department of Government of Maharashtra.

Some of the important functions of MPCB are:

- To plan comprehensive program for the prevention, control or abatement of pollution and secure executions thereof,
- To collect and disseminate information relating to pollution and the prevention, control or abatement thereof,
- To inspect sewage or trade effluent treatment and disposal facilities, and air pollution control systems and to review plans, specification or any other data relating to the treatment plants, disposal systems and air pollution control systems in connection with the consent granted,
- Supporting and encouraging the developments in the fields of pollution control, waste recycle reuse, eco-friendly practices etc.
- To educate and guide the entrepreneurs in improving environment by suggesting appropriate pollution control technologies and techniques
- Creation of public awareness about the clean and healthy environment and attending the public complaints regarding pollution.

Noise Level Measurement

Noise measurement is typically is typically done using a sound level meter (SEL), which is a specialized divec designed to quantify and assess the intensity of sound or noise. When conducting noise measurements, it's essential tl follow established protocols to ensure accurate and representative results. Taking measurements from a tripod at a specific height and distance frome the noise source is an important part of this process.

a) Sability : Tripods provide stability to the sound level meter, ensuring that it remains steady during measurements. This is crucial for obtaining accurate and relible results, as any movement or vibration can introduce errors in the measurements.

b) Heigh of Measurement : It's common to take noise measurements at a height that corresponds to the average ear lavel of humans, which is typically about 1.2 to 1.5 meters (4 to 5 feet)above the ground. This height is chosen because it represents the typical position of a person's ears, makig the measurements more relevant to human exposure.

c) Distance frome the Source : When measuring noise, it's a good idea to set up your equipment about 10-13 feet away fromr the noisy thing you're checking. This distance is chosen because it helps us get a sense of how loud the noise is over an entire area, instead of just right next to the noisy thing itself. It's like stepping back from a speaker at a concert to grt a better idea of how lound the muisc in is the whole room, rather than right next to the speaker where it's super lound.

d) Sefety: When measuring noise levels at a close distance to a very loud source, the sound level meter could be damaged, and the person taking measurements could at risk of hearing damage. Maintaininig a self distance the equipment's longevity and the safty of the operator.

Noice is measured in decibles (dB): A decibel is the standard for the mesuerments of noise. The zero on a decibel scale is at the threshold of heaing, the lowest sound pressure that can be heard. According to D.B. Smith, 20 dB is whisper, 40 dB is quiet office 60 dB is normal conversation and 8 dB is the level at which sound becomes physically painfull

Decibels(dB) 'A' symbol indicates a measurment of a longarithmic scal. In eact case, the actual measurment 'a' is comparde to a fixed to a referencelavel 'r' and the “decibel

'value is defined to be 10 log 10 (a/r). 'A' weighing filters out lower frequencies veryseverely. Fast responses closely match to the simulations of Human ear sensitivity.

Noise Pollution (Regulation and Control) Rules, 2000

The Noise Pollution (Regulation and Control) Rules, 2000 govern each type of noise pollution (Annexure. Prior to this, noise pollution and its causes were addressed by the Air (Prevention and Control of Pollution) Act of 1981.

- On Ferbruary 14, 2000, the Union Government passed the Noise Pollution (Regulation and Control) Rules, 2000 in an effort to reduce the increasing ambient nois level coming from diveres sources in public areas. According to the authority granted to it by the Environment (Protation) Act fo 1986, this was done.
- As stated in Rule 5 of the Noise Rules 2000, the use of loudspeakers and public address systems is restricted.
- Rule 5 was altered in 2010 to frobid the use of sound-producing equipment. Before using this techonology in any of these situations, written consent is necessary.

- The District Magistrate, Police Commissioner, and any other person not below the level of Deputy Superintendent of police are designated as the Noise Rules, 2000's implementing authorities.
- The State Government has the power to permit the use of loudspeakers on or during The hours between 10:00 p.m. And 12:00 a.m. Not suitable for such recreation.

TableNo. 24.1 : Noise Pollution (Regulation and Control) Rules, 2000, Ambient Air Quality Standards In Respect of Noise

Area Code	Category of Area	Limits in dB (A) Leq - Day Time	Limits in dB (A) Leq - Night Time
(A)	Industrial area	75	70
(B)	Commercial area	65	55
(C)	Residential area	55	45
(D)	Silence Zone	50	40

OBJECTIVES

The ambient noise quality was monitored during Diwali – 2023 by the MPCB all over the Maharashta with the following objectives:

- To mesure the ambient noise levels for day and night time during Diwali at various days viz. Per-diwali, on Diwali and post-diwali.
- To compare this year's ambient noise levels with the previous year's noise levels during Diwali period.
- To examine the status and trend of ambient noise over the previous year's noise levels during Diwali period.
- To examine the status and trend of ambient noise levels over the years and develop the noise level database during Diwali period.
- To increase the public awareness about the ill effect of spike of ambient noise levels during Diwali.

Ambient Noise Monitroring and Data Analysis

The noise level data was collected using precalibrated Type- II Sound Level Meters (SLM) and the instantaeous noise levels were measured with the A-weightrd FAST filter. The instrument was mounted on a tripod stand at a height of 1.5 meters frome the ground. To minimize the effect of wind, the windball was used. Data is longged at an interavel of 1 second. The SLM records the sound pressure level (SPL) in decibles (dB).

From these recorded readings, the equivalent steady sound pressure level of a noise energ-averaged over time is calculated as Leq using the following equation:

$$L_{eq,T} = 10\log\left(1/n\sum_{i=1}^{n}10^{\frac{L_i}{10}}\right)$$

Where,

Li = noise level in dB

n = number of observations at an equally spaced time interval

T = Time

The maximum (Lmax), minimum (Lmin), L90, L50 and L10 SPL values were also calcuated. All the results are further compared with last yea's results also. All the results are further compared with Standards of Noise Levels EPA (1986): Noise Pollution (Regultion & Control) Rules, 2000 Central Pollution Control Board (CPCB).

METHODLOGY

The monitoring was carried out for three days considering the nois that generate due to bursting of firecrackers during the festival. For this, considering the noise monitoring for 24 hours was carried out on 6th November 2023 (Post-Diwali), 12th November (on Diwali) and 14th November 2023 (Post-Diwali). The Monitoring was carried out using calibrsted Sound Level Meters (Type II).

In Mumbai a total of 45 locations were monitored viz. 15 locations in Mumbai South, 15 locations in Mumbai Western Suburbs and 15 locations in Mumbai Eastern Suburbs.

Mumbai South: In Mumbai South, a total of fifteen locations were monitored. On 6th November, the highets noise level during day time was observed at Girgaon – Metro Cinema with 87.0 dB(A) and during night time was observed at Byculla – Church (W) with 71.4dB(A). On the day of laxmi poojan i.e on 12th November, the equivalent noise level during day time and night was observed highets at Dadar – Shivaji park with 86.5 dB(A) and 80.9 dB(A) respectively. On day of Post Diwali, 14th November, the equivalent noise level during day time was observed at Kamathipura – Lamathipura with 82.0 dB(A) and during night time Dader – Shivaji Park with 77.5 Db(a).

Mumbai Western Suburbs : In Mumbai Western Suburbs, a total of fifteen locations were monitored. On 6th November, the highest equivalent nois level during day and night time both was observed at Kandivli(E) – StationRoad with 73.2 dB(A) and 70.6dB(A) On 12th November, the highest equivalent noise level during day time was observed with 84.4 dB(A) during night time. However, on 14th November, the hightest equivalent noise level during dat and night time was observed at Kandivali east with 81.1dB(A) and 78.0dB(A).

Mumbai Eastern Suburbs: In Mumbai Eastern Suburbs, a total of fifteen locations were monitored.

On 16th November, the highest equivalent noise level during day time andcnight time was observed at Dharavi with 81.8dB(A) and 70.7dB(A) respectively. On 12th November, the highest equivalent noise level during day was observed at Dharavi with 80.4dB(A) and during night time at Sewree with 85.4dB(A) respectively. However, on 14th november, the highest equivalent noise level during day time was observed at Dharavi with 78.2dB(A) and during night time was observed at Sewree whit 84.3dB(A).

Conclusion :

This study has shown that in the year 2023, due to bursting of cracks, the noise level in the overall atmosphere has increased in most places. For example. As on 12th November, 2023, the noise levels at most of the locations are found to be higher than the prescribed standards.

As per the direction of the Central Pollution Control Board, the Maharashtra Pollution Control Board also has to do important work related to the environment, such as the Action Plan for Control of Air Pollution of Mumbai , Maazi Vasundhara, Swachh Bharat Abhiyan, implementing various central initiatives and schemes, and submitting project reports in this regard. Also, the work of air pollution measurement is done by the Continuous Ambient Air Quality Monitoring Station under the Regional and Sub-Regional Departments of the Maharashtra Pollution Control Board across the state. The Continuous Ambient Air Quality Monitoring Station of Maharashtra Pollution Control Board in the jurisdiction of Brihanmumbai Municipal Corporation are given in Table No.24.2 .

Table No. 24.2 MPCB : CAAQMS

Sr. No.	Locations	Address
1	Sion	Lokmanya Tilak Hosp. Sion
2	Bandra	Government Polytechnic Collage, Kherwadi
3	Kandivali	M/s. Mahendra & Mahendra Co. Western Express Highway, Kandivli-E
4	Mulund	M/s Jonson & Jonson Co, LBS Rd, Mulund
5	Borivli	Near Lion Safari, National Sanjay Gandhi Park, Borivli (E)
6	Vile-Parle	Coopar Hosp and Medical Collage, Bhakti Vedant Swami Marg, Juhu Scheme, Vile-Parle (W)
7	Kurla	Phonics City Mall, LBS Rd, Kurla (E)
8	Powai	I I T Powai
9	C.S.Intl. Airport (T2)	Near Gate No. 6, C. S. Intl. Airport (T2) Vile-Parle
10	Colaba	Seveg Project, Near Afgan Church, ABS Rd, Nevy Nagar, Colaba
11	Worli	NEERI, 99-B, Dr. A.B.Rd, Worli
12	B.K.C.	Near Asian Heart Hosp. Bandra (E)
13	Chembur	Municipal School, Mahul Gaon, Chembur
14	Malad	Mind Space, Malad (W)


MAHARASHTRA POLLUTION CONTROL BOARD
CHEMBUR
AMBIENT AIR QUALITY DATA
04/08/2024
Sunday
03 45 PM
PARAMETER
STANDARD
VALUE
UNIT
Particulate Matter(PM10)
100 ug/m3
82.42
ug/m3
Particulate Matter(PM2.5
60 ug/m3
35.04
ug/m3
Sulphur Dioxide(SO2)
80 ug/m3
Nitrogen Dioxide(NO2)
80 ug/m3
ug/m3

25. MUMBAI CLIMATE ACTION PLAN

Abstract:

The various developments taking place in this metropolis have a direct impact not only on the economy of the state but also on the economy of the country. This coastal metropolis is currently facing many problems due to climate change. Unseasonal rain, heavy rainfall, precipitation, heat waves, urban pollution etc. against this backdrop, the 'Mumbai Environment Action Plan' prepared by the Brihanmumbai Municipal Corporation is the first step taken to curb environmental change and its possible side effects. Brihanmumbai Municipal Corporation is the first municipal corporation in the country to prepare such an Environmental Action Plan.

Concept of Planning

Government of Maharashtra and Mumbai Municipal Corporation started preparation of Environment Action Plan on August 2021. This plan was prepared in collaboration with 'C40 Cities Network' and 'World Resources Institute of India'. Environmental thinkers, Academic Institution, Professional Consultants also have a valuable contribution in the planning process.

The launch ceremony of the ambitious initiative of the Mumbai Climate Action Plan (MCAP) concluded on 13th March 2022. The MCAP is committed to a net zero emission by 2050. The 'Mumbai Environment Action Plan' is a comprehensive strategy to address the impacts of climate change in Mumbai Metropolitan Region , focusing on mitigation measures and climate change adaptation.

Objective of Planning

The 'Mumbai Environment Action Plan sets short-term and long-term environmental objectives for the city. Accordingly, considering the base year 2019, the target has been set to reduce carbon emissions in Mumbai by 30 percent by 2030 and 44 percent by 2040. Ultimately, carbon emissions are expected to drop to zero by 2050. Coal-based power generation is the largest source of carbon emissions. Therefore, by the year 2030, 50 percent of the total energy generation will be generated from sustainable sources. This ratio will be increased to 90 percent by the year 2050.

In the Mumbai Climate Action Plan, future emissions have been analysed on the basis of the following three scenarios.

1. Emissions will be around 64.8 million tons per year by 2050 if current day-to-day environmental conditions are not improved.

2. Existing and planned scenarios include local, regional or national measures policies and programs to reduce emissions. Accordingly, emissions are expected to be 51.3 million tonnes per year by 2050. It represents an increase of 119.4% over base year (2019) emissions.

3. While implementing the Mumbai Climate Action Plan, targets have been set to reduce emissions by 27% by 2030 and 72% by 2050.

The Mumbai Climate Action Plan aims to focus on six key actions.

1. **Electricity and Buildings:** To build energy and power generation climate-friendly infrastructure with minimal carbon emissions.
2. **Sustainable Transport:** Increasing the use of public transport and promoting zero carbon sustainable transport.
3. **Sustainable Waste Management:** Minimizing use of landfills emphasis on decentralized waste management solutions schemes. Also scientific management of landfill site .
4. **Urban Greening and Biodiversity:** Increasing urban green cover and permeable land cover to reduce urban atmospheric heat. Making green spaces available to all. To restore and conserve biodiversity.
5. **Air Quality:** Controlling on increase pollution. Enhancement of Air Monitoring System and Emphasis on Data Collection. Decentralization of planning as well as increasing public awareness on health.
6. **Floods and Water Resource Management:** Build mechanisms and infrastructure to cope with floods, increase water storage capacity, reduce pollution and restore aquatic ecosystems. Supply clean drinking water at affordable rates. Increasing availability of clean and safe sanitation and managing emergency risk.

Establishment of Special Cell to deal with Climate Change:

Dealing with the issue of climate change requires coordination between different departments. Mumbai's Climate Action Plan hasexpressed Strict implementation of the plan The need to have a designated authority for identification of carbon emission sources and their assessment etc. in. In this background, it is aimed to expand the scope of work of the BriahnMumbai Municipal Corporation's Environment Department and transform it into the 'Environment and Climate Change' Department. Additional Municipal Commissioner (City) will be entrusted with the role of coordinating officer of this department. Objectives of the newly established Department of Environment and Climate Change are;

1. Coordinating tools and using state-of-the-art technology across all departments to achieve climate goals.
2. Develop guidelines for new infrastructure and building projects.

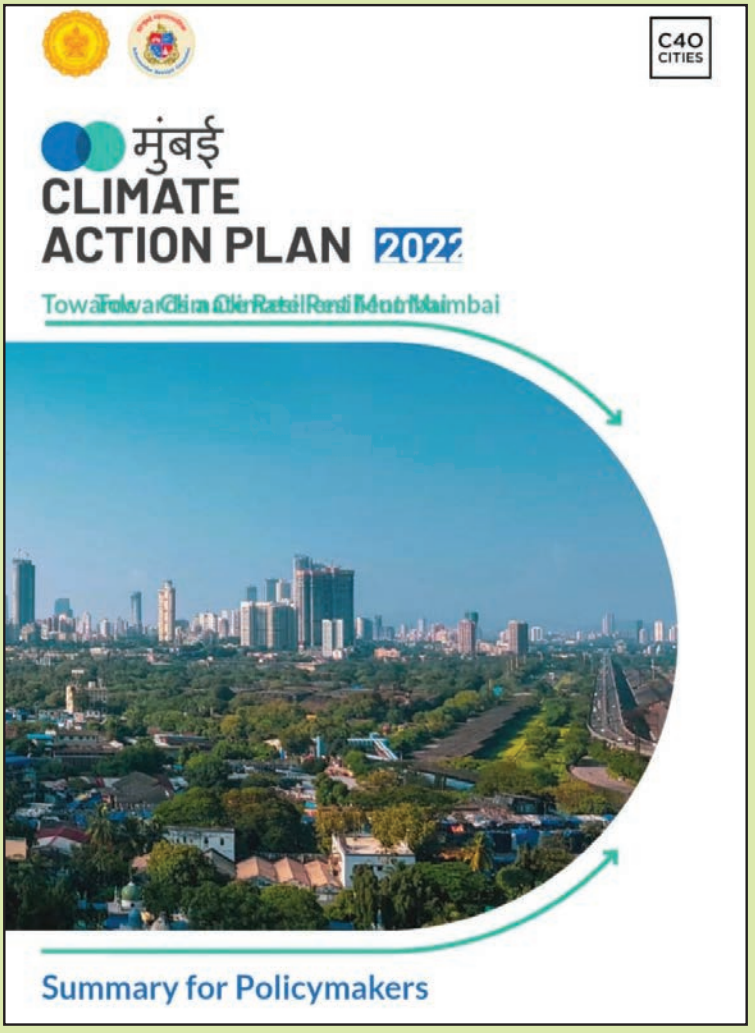
3. Focusing on strict implementation of Mumbai Environment Action Plan.

The Department of 'Environment and Climate Change' will be divided into the following three sub-divisions.

1. Monitoring, Assessment, Report Sub Division: Coordinating with all Departments and Circle Offices of Brihanmumbai Municipal Corporation and implementation of Action Plan and Information on Greenhouse gas Emission Sources.
2. Remedial Planning Sub Section: Remedial Planning on Climate Change Issues.
3. Building and Transport Sub-Division: Efforts to reduce carbon emissions from buildings and transport sectors.

The Mumbai Climate Action Plan will submit a report every six months to the 'Maharashtra Council for Climate Change' to periodically ensure that the plan is being strictly implemented.

'Mumbai Climate Action Plan' is available in detail at http://masap.masigm.goa.in.



26. MUMBAI'S AIR POLLUTION MITIGATION PLAN

1. Introduction

Mumbai City is witnessing a growth in construction & infrastructure projects. Large numbers of these projects and contributions from other sources such as Vehicular Emission, Industries, Unclean Fuel usage, etc. are creating a challenge in the form of rising Air Pollution levels.

Deterioration of Ambient Air Quality leads to environmental concerns and will lead to health problems based on the exposure duration and levels of pollutants.

Various short-term and long-term activities are being undertaken for the prevention and control of air pollution in Mumbai City. This winter, Mumbai witnessed noticeable rise in the air pollution levels due to prevailing longer calm weather conditions combined with emissions from various sources of air pollution.

Thus, to strike a balance between controlling pollution levels and strengthening Mumbai's infrastructure, the Brihanmumbai Municipal Corporation (BMC) has decided to introduce and enforce an immediate action plan for the mitigation and prevention of rising air pollution levels in Mumbai City.

2. Instructions from Hon. M.C on Mumbai's Air Pollution Mitigation Plan:

Hon. M.C. has constituted a committee on 13/03/2023 to formulate the strategy for implementation of "Mumbai's Air Pollution Mitigation Plan" as announced in the BMC Budget for the Year 2023-24.

The TOR's of the Committee are as under:

1) Find out the reasons for the high degree of air pollution in Mumbai.
2) Suggest measures to reduce / minimize air pollution due to infrastructure projects, such as Metro, Roads, SWD, Coastal Roads, STPs, etc.
3) Measures to minimize air pollution due to building construction projects.
4) Monitoring mechanism for overseeing the implementation of air pollution mitigation measures including penalizing the delinquents.

3. Proposed Action Plan:

Brihanmumbai Municipal Corporation (BMC) has conducted few meetings with committee members and technical advisory committee members to formulate Mumbai's Air Pollution Mitigation Plan. Literature Review of existing actions plans1, reports2, guidelines3 etc. was also taken into account.

Mumbai's Air Pollution Mitigation Plan will help to improve air quality by identifying immediate

practical and result oriented actions including the long-term strategies that needs to be undertaken by concerned departments to reduce the emissions from various air pollution sources.

The Action Plan has included-

- Identification of Air Pollution Sources-

To understand important sources of Air Pollution in Mumbai city for-

i) Source Wise Inventory of important information related to Air Pollution Source-

- To generate the information related to sources,
- to effectively implement the mitigation plan targeting sources,
- corrective measures that can be undertaken during implementation,
- target setting for further improvement etc.

Categorization of Projects-

- To enforce guidelines stringently for Building and Construction Projects & Road Projects.

ii) Source Wise Actions to Mitigate Air Pollution-

- To undertake immediate actions for prevention & control of Air Pollution.
- Details on the Long-term Actions that can be undertaken.

iii) Checklist on Actions-

- To assess the actions that will be undertaken by various departments.

iv) Source Wise Enforcement Mechanism for Immediate Action Plan-

- To develop ward level task force for enforcement of immediate action plan.

v) Source Wise Monitoring Mechanism for Immediate Action Plan-

- To monitor the progress of implementation of immediate action plan.

vi) Actions for Non-Compliance-

- To undertake stringent actions on defaulters based on the inspection.

vii) Review Mechanism-

- To review the implementation of the progress of implementation of immediate action plan.

viii) Corrective Actions-

- To undertake the corrective measures on limitations & the implementation of the progress of implementation of immediate action plan based on the periodic review.

4. Major Air Pollution Sources identified

♦	1) Dust arising from Construction & Demolition Activity from various projects,
♦	2) Road Dust & its Resuspension,
♦	3) Open burning of Solid Waste/Garbage & Other Waste,
♦	4) Unclean Fuel usage in Hotels, Restaurants, Dhabas, Bakeries, & Other Establishments,
♦	5) Crematoria,
♦	6) Industries-
•	Ready Mix Concrete (RMC) Batching Plant- Commercial & Captive Plant,
•	Casting Yard Plants,
•	Hot Mix Plants,
•	Red, Orange & Green Industries having high Air Pollution score &
•	Informal Sector- Pottery etc.
♦	7) Vehicular Emission,
♦	8) Unclean Fuel usage in Households,
♦	9) Pollution from neighbourhood areas of BMC,
♦	10) Other Sources-
	i) Pigeon Feeding Sites.
	ii) Fire Crackers etc.

5. Control of Air Pollution from Building Construction Activity

5.1 Inventory of Building Construction Projects-

The ward wise template will include information related to ongoing Building Construction Project-

Number & Location of Building Construction Project having Plot Area	
>4,000 Sq. Mtr. (Large Project)	<4,000 Sq. Mtr. (Small Project)

5.2 Actions to Mitigate Air Pollution –

These guidelines are mandatorily to be undertaken by all the ongoing & proposed Building Construction projects.

5.2.1. Guidelines for Building Construction Projects-

Phase	Environmental Guidelines for Prevention & Control of Dust
Demolition Works-	
Demolition of existing structure	1) Erection of continuous Dust or Wind Breaking Tin/Metal Sheet of more than 20 Feet Height around the periphery of entire Construction Project Site.
	2) Tarpaulin/Green Cloth/Jute Sheet to be used on scaffolding covering an entire area under demolition structure. Regular Cleaning of Tarpaulin or Jute Sheet to be undertaken.
	3) Avoid on-site Crushing & Hammering of Demolition Material.
	4) Water Sprinkling shall be continuously carried out so that the Debris shall remain in wet condition.
	5) Water Fogging should be carried out during the Excavation & Loading & Unloading of material.
	6) C & D waste generated within the premises / site of work is transported to the designated unloading site strictly as per the BMC approved C & D Waste Management Plan.
Construction Works-	
During construction	1) Erection of continuous Dust or Wind Breaking Tin/Metal Sheet of more than 20 Feet Height around the periphery of entire Construction Project Site.
	2) Tarpaulin/Green Cloth/Jute Sheet to be mandatorily used to cover the floor where any construction activity is in progress and two floors below it. Regular Cleaning of Tarpaulin or Jute Sheet to be undertaken.
Excavation	1) During the start of the Excavation, soil strata shall be suitably watered/water sprinkled from time to time.
	2) Water Fogging should be carried out during the Excavation, Loading & Unloading of material.
Storage of Construction & Demolition Material	1) Loose Soil, Sand, Construction Materials and Debris of any kind & quantity should be stored in the demarcated/dedicated area, properly barricaded & fully covered/enclosed/protected with tarpaulin.
	2) Complete Ban on dumping of Construction Material and Debris on Public Roads, Footpaths, Pavements & Open Area.
	3) Appropriate dust extraction system with appropriate Air Pollution Control Technology to be provided, if required.
Super Structure Construction	1) Chutes, Skips & Transfer Point used for dropping/transfer of material shall be enclosed & should be properly operated & maintained to avoid emission & spillage.
	2) Water Sprinkling & Water Fogging should be carried out during construction & super structure construction activity, material handling operations, loading as well as unloading of material.
	3) Grinding, cutting, drilling, sawing & trimming should be carried out in enclosed area and Water Sprinkling & Water Fogging to be used.
	4) Mixing and manual batching of concrete at the site should be avoided. However, in unavoidable circumstances, it should be done in an enclosed/confined area.
	5) Mixing of materials for plaster should be undertaken in enclosed/confined area.
Transportation (Vehicles carrying construction material and construction debris & Other Vehicles)	1) Inside the project premises, vehicle movement should be slow & should be carried out only on fixed route. The fixed route should be paved or hard top & regularly sprinkled with water.
	2) All vehicles should be thoroughly cleaned after unloading of material.
	3) All vehicles carrying material should be fully covered and protected so as to ensure dust from construction material or debris does not become air-borne during transportation.
	4) All vehicles carrying material should mandatorily obtain Pollution under Control Certificate (PUC) & shall produce it as & when asked.
	5) All vehicles carrying material should be loaded in proper manner to avoid spillage & overloading.
	6) After loading & unloading of material, two level tyre washing facility shall be provided at all exit points. The waste water generated shall be collected & treated/reused in construction process before disposal.

	7) C & D waste generated within the premises / site of work shall be transported to the designated unloading site strictly as per the BMC approved C & D Waste Management Plan.
Others	1) Only after mild water sprinkling- Brushing, Brooming & Sweeping should be undertaken on daily basis. Daily Cleaning to be carried out at Entry & Exit of Gate & Nearby Roads for removal of Dust. If possible, vacuum sweeping be carried out at Dust Laden areas/routes.
	2) Other unpaved surfaces & areas with loose soil should be adequately water sprinkled.
	3) Use of Green Walls, Screens, Other Vegetation Barriers & any other innovative dust minimizing technologies.
	4) DG Set (if installed) to be compliant with CPCB/MPCB Standards. If possible, Temporary Power Supply connections to be obtained.
	5) Mandatorily use of Personal Protective Equipment (PPE)- Mask, Goggles etc.
	6) All Project attracting Environmental Clearance shall carry out Third Party Ambient Air Monitoring every fortnightly from NABL/MoEF&CC Laboratory.
	7) Complete Ban on use of New/ Discarded Wood &/or Wood Products by construction workers, security guards etc. as a cooking fuel or bonfires to prevent open burning.
	8) Discarded Wood &/or Wood Products from Construction and Demolition Activity to be disposed off in scientific manner to avoid the open burning.

Ready-Mix Concrete (RMC) Batching Plants- Commercial & Captive Plant- All the Ready-Mix Concrete (RMC) Batching Plants- Commercial & Captive Plant have to obtain the Maharashtra Pollution Control Board (MPCB) Consent to Establish & Operate and have to comply to the 'Guidelines for citing criteria of Ready-Mix Concrete (RMC) plant' published by Notification vide No. MPCB/AS(T)/TB/B-436 dated 7th November 2016.

(https://www.mpcb.gov.in/sites/default/files/standing_orders/RMC_Gazette_circular.p df)

5.3 Categorization of Building & Construction Projects-

Based on Plot Area, the Building & Construction Projects are categorized into-

Sr. No.	Category of Projects	Plot Area Classification
1)	Large Projects	>4,000 Sq. Mtr.
2)	Small Projects	Upto 4,000 Sq. Mtr.

5.4 Checklist on Actions-

Based on the above environmental guidelines, the checklist will be prepared by concerned department/ ward.

5.5 Enforcement Mechanism-

1. The above guidelines will be immediately circulated to all the Project Proponents/Architect/Land Surveyors through Online AutoDCR Systems.
2. The concerned Project Proponent and registered site supervisor shall be responsible to comply the said guidelines.

3. The guidelines will also be circulated for enforcement to other departments such as,

♦ Special Planning Authorities such as

4. Maharashtra Housing & Area Development Authority (MHADA), Maharashtra Industrial Development Corporation (MIDC), Mumbai Metropolitan Region Development Authority (MMRDA), Mumbai Port Trust (MPT), Maharashtra State Road Development Corporation (MSRDC) & Slum Rehabilitation Area (SRA).

♦ Other Government Departments such as Airport Authority of India (AAI), Indian Defense, Mumbai Maritime Board (MMB), Public Works Department (PWD), Railways & Maharashtra Forest Department.

5.6 Monitoring Mechanism-

1) Concerned Project Proponent/Architect/ Land Surveyors shall submit online self- certification complying on said guidelines on weekly basis.

2) BMC's Auto DCR portal will be provided with separate tab to submit the progress of Dust Mitigation Measures of site along with photos/videos.

5.7 Actions for Non-Compliance-

1) On failure of compliance, Warning Letter to be issued to the project proponent for rectification/ compliance within a week.

2) Pursuant to the warning letter, if the project proponent fails to comply then further penal action as per provisions of MMC/MRTP Act including issuing stop work notice shall be initiated.

6. Control of Air Pollution from Road & Bridge Construction

6.1. Inventory of Road & Bridge Construction Works-

The ward wise template will include information related to number of ongoing construction/ demolitions works of Road & Bridge Construction Works such as- Major Roads, Minor Roads, Flyovers, Bridges, Rail over Bridges (RoBs), Foot over Bridges (FoBs).

Ongoing construction/ demolitions of	Name	Locations	Number	Details (in Km.)	Remarks
Major Roads					
Minor Roads					
Flyovers					
Bridges					
Rail over Bridges (RoBs)					
Foot over Bridges (FoBs)					

6.2. Actions to Mitigate Air Pollution-

These guidelines are mandatorily to be undertaken by all the ongoing & proposed Road Construction Works.

6.2.1. Guidelines for Road & Bridge Construction Works such as Major Roads, Minor Roads, Flyovers, Bridges, Rail over Bridges (RoBs), Foot over Bridges (FoBs)-

Phase	Environmental Guidelines for Prevention & Control of Dust
Trenching	1) Before the start of the excavation or trenching work, continuous metal barricades shall be provided around the work site. Tarpaulin/Green Cloth/Jute Sheet to be used to cover the open area of metal barricade.
Excavation	1) During the start of the Excavation, soil strata or roads shall be suitably watered/water sprinkled from time to time.
	2) Water Fogging should be carried out during the Excavation, Loading & Unloading of material.
	3) C & D waste generated within the premises / site of work is transported to the designated unloading site as per the BMC approved C & D Waste Management Plan.
Storage of Material	1) Sand, Construction Materials and Debris of any kind & quantity should be stored in the demarcated/ dedicated area, properly barricaded & fully covered/enclosed/protected with tarpaulin. 2) All Debris generated shall be removed within 24 hrs. of generation.
Construction	1) Construction activity, loading & unloading of material shall be carried out properly to avoid emission & spillage out of the barricade. 2) Water Sprinkling should be carried out during construction activity, material handling operations, loading as well as unloading of material.
Cement Concrete Wearing Course	1) Mandatorily Use of water during the concrete road joint cutting.
Transportation (Vehicles carrying construction material and construction debris)	1) All vehicles should be thoroughly cleaned after unloading of material.
	2) All vehicles carrying material should be fully covered and protected so as to ensure dust from construction material or debris does not become air-borne during transportation.
	3) All vehicles carrying material should mandatorily obtain Pollution under Control Certificate (PUC) & shall produce it as & when asked.
	4) All vehicles carrying material should be loaded in proper manner to avoid spillage & overloading.
Others	1) Brushing, Brooming & Sweeping of road work as well as road side parallel to metal barricade should be undertaken.
	2) Mandatorily use of Personal Protective Equipment (PPE)- Mask, Goggles etc.
	3) Complete Ban on use of New/ Discarded Wood &/or Wood Products by construction workers, security guards etc. as a cooking fuel or bonfires to prevent open burning.
	4) Discarded Wood &/or Wood Products from Construction and Demolition Activity to be disposed off in scientific manner to avoid the open burning.

6.3. Categorization of Road Works Projects-

Based on road width, the Road Works Projects are categorized into-

Sr. No.	Category of Road Works Project	Width
1)	Major Road	> 9 meters
2)	Minor Road	< 9 meters

6.4. Checklist on Actions-

Based on the above environmental guidelines, the checklist will be prepared by concerned department/ ward.

6.5. Enforcement Mechanism-

1) The above guidelines will be immediately circulated to all the Contractors for implementation.

2) The concerned contractors shall be responsible to comply with the said guidelines.

3) The guidelines will also be circulated for enforcement to other departments such as,

♦ **Special Planning Authorities such as**

Maharashtra Housing & Area Development Authority (MHADA), Maharashtra Industrial Development Corporation (MIDC), Mumbai Metropolitan Region Development Authority (MMRDA), Mumbai Port Trust (MPT), Maharashtra State Road Development Corporation (MSRDC) & Slum Rehabilitation Area (SRA).

Other Government Departments such as Airport Authority of India (AAI), Indian Defence, Mumbai Maritime Board (MMB), Public Works Department (PWD), Railways & Maharashtra Forest Department.

6.6. Monitoring Mechanism-

1) Concerned contractor shall submit self- certification complying on said guidelines on weekly basis to the concerned Department's Deputy Chief Engineer.

6.7. Actions for Non-Compliance-

1) On failure of compliance, Warning Letter to be issued to the contractor for rectification/ compliance.

2) Pursuant to the warning letter, if the contractor fails to comply or shows negligence towards adoption & enforcement of guidelines then further stringent action including penal actions as per contract conditions will be initiated.

7. Control of Air Pollution from Urban & Civic Infrastructure

7.1. Inventory of Urban & Civic Infrastructure Projects-

The ward wise template will include information related to number of ongoing construction/ demolitions works of-

a) Urban Infrastructure such as Metro, Mono, Projects of MMRDA, MSRDC, PWD, Railway Construction Projects etc.

b) Civic Infrastructure Projects of BMC's Departments- Hydraulic Engineer (H.E.), Water Supply Projects (W.S.P.), Sewerage Operations (S.O.), Sewerage Projects (S.P.), Storm Water Drains (S.W.D.), Municipal Sewage Disposal Projects (M.S.D.P.), Mechanical & Electrical (M&E), Coastal Road etc.

Ongoing construction/demolitions of	Name	Locations	Number	Details (in Km.)	Number of RMC Plant	Number of Casting Yard
Metro Projects						
Mono Projects						
Urban Infrastructure Projects- MMRDA, MSRDC, PWD etc.						
Railway Construction Projects						
Civic Infrastructure Projects-HE, WSP, SO, SP, SWD, MSDP, M&E, Coastal Road etc.						
Others						

7.2. Actions to Mitigate Air Pollution -

These guidelines are mandatorily to be undertaken by all the ongoing & proposed Road Construction Works.

7.2.1. Guidelines for-

i) Urban Infrastructure such as Metro, Mono, Projects of MMRDA, MSRDC, PWD, Railway Construction Projects etc.

ii) Civic Infrastructure Projects of BMC's Departments such as Hydraulic Engineer (H.E.), Water Supply Projects (W.S.P.), Sewerage Operations (S.O.), Sewerage Projects (S.P.), Storm Water Drains (S.W.D.), Municipal Sewage Disposal Projects (M.S.D.P.), Mechanical & Electrical (M&E), Coastal Road etc.

Phase	Environmental Guidelines for Prevention & Control of Dust
Demolition Works	
Demolition of existing structure	1) Erection of Tin/Metal Sheet or Metal Barricade around the periphery of entire structure. 2) Tarpaulin/Green Cloth/Jute Sheet to be used covering an area under demolition structure. Regular Cleaning of Tarpaulin or Jute Sheet to be undertaken. 3) Avoid on-site Crushing & Hammering of Demolition Material. 4) Water Sprinkling shall be continuously carried out so that the Debris shall remain in wet condition. 5) Water Fogging should be carried out during the Excavation & Loading & Unloading of material. 6) C & D waste generated within the premises / site of work is transported to the designated unloading site strictly as per the BMC approved C & D Waste Management Plan.

Phase	Environmental Guidelines for Prevention & Control of Dust
Construction Works	
During construction	1) Erection of Tin/Metal Sheet or Metal Barricade around the periphery of structure. 2) Tarpaulin/Green Cloth/Jute Sheet to be used to cover the structure & Regular Cleaning of Tarpaulin or Jute Sheet to be undertaken.
Trenching & Excavation	1) During the start of the Excavation, soil strata or surface shall be suitably watered/water sprinkled from time to time. 2) Water Fogging should be carried out during the Excavation & Loading & Unloading of material.
Storage of Construction & Demolition Material	1) Loose Soil, Sand, Construction Materials and Debris of any kind & quantity should be stored in the demarcated/ dedicated area, properly barricaded & fully covered/enclosed/protected with tarpaulin. 2) Complete Ban on dumping of Construction Material and Debris on Public Roads, Footpaths, Pavements & Open Area. 3) Appropriate dust extraction system with appropriate Air Pollution Control Technology to be provided, if required.
Construction & Super Structure Construction	1) Chutes, Skips & Transfer Point used for dropping/transfer of material shall be enclosed & should properly operate & maintain to avoid emission & spillage out of the barricade. 2) Water Sprinkling & Water Fogging should be carried out during construction & super structure construction activity, material handling operations, loading as well as unloading of material. 3) Grinding, cutting, drilling, sawing & trimming should be carried out in enclosed area and Water Sprinkling & Water Fogging to be used. 4) Mixing and manual batching of concrete at the site should be avoided. However, in unavoidable circumstances, it should be done in an enclosed/confined area. 5) Mixing of materials for plaster should be undertaken in enclosed/confined area.
Transportation (Vehicles carrying construction material and construction debris & Other Vehicles)	1) Inside the project premises, vehicle movement should be slow & should be carried out only on fixed route. The fixed route should be paved or hard top & regularly sprinkled with water. 2) All vehicles should be thoroughly cleaned after unloading of material. 3) All vehicles carrying material should be fully covered and protected so as to ensure dust from construction material or debris does not become air-borne during transportation. 4) All vehicles carrying material should mandatorily obtain Pollution under Control Certificate (PUC) & shall produce it as & when asked. 5) All vehicles carrying material should be loaded in proper manner to avoid spillage & overloading. 6) After loading & unloading of material, two level tyre washing facility shall be provided at all exit points. The waste water generated shall be collected & treated/reused in construction process before disposal. 7) C & D waste generated within the premises / site of work is transported to the designated unloading site strictly as per the BMC approved C & D Waste Management Plan.
Others	1) Only after mild water sprinkling- Brushing, Brooming & Sweeping of work area as well as road side parallel to metal sheet/barricade should be undertaken on daily basis. Daily Cleaning to be carried out at all Entry & Exit of Gate & Nearby Roads for removal of Dust. If possible, vacuum sweeping can be carried out at Dust Laden areas/routes. 2) Other unpaved surfaces, areas with loose soil should be adequately water sprinkled. 3) Use of Green Walls, Screens, Other Vegetation Barriers & any other innovative dust minimizing technologies. 4) (if installed) to be compliant with CPCB/MPCB Standards. If possible, Temporary Power Supply connections to be obtained. 5) Mandatorily use of Personal Protective Equipment (PPE)- Mask, Googles etc. 6) All Project attracting Environmental Clearance shall carry out Third Party Ambient Air Monitoring every fortnightly from NABL/MoEF&CC Laboratory. 7) Complete Ban on use of New/ Discarded Wood &/or Wood Products by construction workers, security guards etc. as a cooking fuel or bonfires to prevent open burning. 8) Discarded Wood &/or Wood Products from Construction and Demolition Activity to be disposed off in scientific manner to avoid the open burning.

7.2.2. Ready-Mix Concrete (RMC) Batching Plants -

Ready-Mix Concrete (RMC) Batching Plants engaged for the construction of project have to obtain the Maharashtra Pollution Control Board (MPCB) Consent to Establish & Operate and have to comply to the 'Guidelines for sitting criteria of Ready-Mix Concrete (RMC) plant' published by Notification vide No. MPCB/AS(T)/TB/B-436 dated 7th November 2016. (https://www.mpcb.gov.in/sites/default/files/standing_orders/RMC_Gazette_circular.p df)

7.2.3. Casting Yard Plants-

Casting Yard Plants engaged for the construction of project have to obtain the Maharashtra Pollution Control Board (MPCB) Consent to Establish & Operate and have to comply with the Environmental Clearance & Consent Conditions.

7.3. Checklist on Actions-

Based on the above environmental guidelines, the checklist will be prepared by concerned department/ward.

7.4. Enforcement Mechanism-

7.4.1. For Urban Infrastructure Projects-

1) The above guidelines will be immediately circulated to all the Agencies for implementation.

2) The concerned agencies shall be responsible to comply with the said guidelines.

7.4.2. For Civic Infrastructure Projects (HE, WSP, SO, SP, SWD, MSDP, M&E, Coastal Road etc.) of BMC-

1) The above guidelines will be immediately circulated to all the Contractors for implementation.

2) The concerned contractors shall be responsible to comply with the said guidelines.

7.5. Monitoring Mechanism-

7.5.1. For Urban Infrastructure Projects-

1) Maharashtra Pollution Control Board (MPCB) on weekly basis to monitor the Environmental Clearance & Consent Conditions for Urban & Civic Infrastructure Projects.

7.5.2. For Civic Infrastructure Projects (HE, WSP, SO, SP, SWD, MSDP, M&E, Coastal Road etc.) of BMC-

1) Concerned contractor shall submit self- certification complying on said guidelines on weekly basis to the concerned Department's Deputy Chief Engineer.

7.6. Actions for Non-Compliance-

7.6.1. For Urban Infrastructure Projects-

1) On failure of compliance, Maharashtra Pollution Control Board (MPCB) will take legal action as per the provision of Water Act, 1974, Air Act, 1984 & Hazardous & Other Waste (Management and Transboundary Movement) Rules, 2016 and as per the MPCB's Enforcement Policy, 2016.

7.6.2. For Civic Infrastructure Projects (HE, WSP, SO, SP, SWD, MSDP, M&E, Coastal Road etc.) of BMC-

1) On failure of compliance, Warning Letter to be issued to the contractor for rectification/ compliance.

a. Pursuant to the warning letter, if the contractor fails to comply or shows negligence towards adoption & enforcement of guidelines then further stringent action including penal actions as per contract conditions will be initiated.

8. Control of Road Dust Resuspension

8.1. Road Improvement & Maintenance –

8.1.1. Actions to Mitigate Air Pollution from

Improvement of Road Infrastructure & Regular Maintenance of Roads for 100% pavement & pothole free roads is effective way to prevent & control Resuspension of Road Dust. It is suggested to undertake below mentioned immediate & long-term actions.

	Actions to be undertaken
Immediate Actions	1) Identify Major & Minor Roads for Bad Patches, Potholes, Unpaved Roads. 2) Road Repairs works to be undertaken for improvement of Bad Patches. 3) Filling of Potholes on all roads & special emphasis to be given for Important Roads, Major Roads & Minor Roads with high vehicular traffic movement. 4) Paving of Unpaved Roads Patches. 5) Surfacing/Blacktopping on trench patch.
Long-Term Actions	1) Undertake Road Widening Works for Decongestion of Road Traffic. 2) Removal of obstacles on roads in consultation with Traffic Police to remove traffic bottleneck for smooth vehicle movement. 3) Conducting audit of Traffic Intersection & if required install Traffic Signals in co-ordination with Traffic Police. 4) Intelligent Traffic Management System (ITMS) covering all traffic signals.

8.1.2) Checklist on Actions-

Based on the above actions, the checklist will be prepared by concerned department/ward.

i. Enforcement Mechanism-

1) The above actions will be circulated to all the Contractors for implementation.

2) The concerned contractors shall be responsible to comply with the said actions.

ii. Monitoring Mechanism-

1) Concerned contractor shall submit self- certification complying on said actions on weekly basis to the concerned Department's Deputy Chief Engineer.

iii. Actions for Non-Compliance-

a) On failure of compliance, Warning Letter to be issued to the contractor for rectification/ compliance.

b) Pursuant to the warning letter, if the contractor fails to comply or shows negligence towards adoption & enforcement of actions then further stringent action including penal actions as per contract conditions will be initiated.

8.2. Road Sweeping & Road Cleaning

8.2.1. Inventory for Road Sweeping & Cleaning-

The ward wise template will include information related to Sweeping & Cleaning of				
	Name	Length (in Km.)	Sweeping Type	
			Manual (in Km.)	Operational Mechanical Power Sweeping (MPS) (in Km.) & No. of MPS deployed/in operations
Major Roads				
Minor Roads				

8.2.2. Actions to Mitigate Air Pollution -

Due to large scale construction & infrastructure work & its transportation, frequency of dust generation on roads has been increased. To control this, it is suggested to undertake below mentioned immediate & long-term actions.

	Actions to be undertaken
Immediate Actions	1) Ward-wise special inspection drive to identify High & Frequent Dust Laden Major & Minor Roads. 2) Special drive to be undertaken for Dust Scrapping, Road Brushing, Sweeping & Cleaning of all Public Roads including Highways & special focusing on High & Frequent Dust Laden Major & Minor Roads. 3) After Road Brushing & Sweeping, Sprinkling of Water during nights to be carried out. 4) Use of Water Foggers during the day time for control of Dust.
Long-Term Actions	1) Assessment of City's requirement for Mechanical Sweepers & Procurement as per the requirement. 2) Preference to be given to Regenerative Air Sweeping Machines & Vacuum Power Sweeping Machines over Power Sweepers. 3) Use of Vehicle Mounted Water Sprinkling Machine & Vehicle Mounted Water Fogging Machine after Road Scrapping, Brushing & Sweeping.

8.2.3. Checklist on Actions-

Based on the above actions, the checklist will be prepared by concerned department/ward.

8.2.4. Enforcement Mechanism-

1. The above actions will be circulated to the department/contractor for implementation.
2. The concerned department/contractor shall be responsible to comply with the said actions.

8.2.5. Monitoring Mechanism-

1) Concerned contractors shall submit self- certification complying on said actions on weekly basis to the concerned Assistant Engineer (SWM).

8.2.6. Actions for Non-Compliance-

1) On failure of compliance, Warning Letter to be issued to the contractor for rectification/ compliance.

2) Pursuant to the warning letter, if the contractor fails to comply or shows negligence towards adoption & enforcement of actions then further stringent action including penal actions as per contract conditions will be initiated.

9. Control of Air Pollution from Open Burning

9.1 Inventory for Open burning of Solid Waste/Garbage & Other Waste-

The ward wise template will include information related to Solid Waste Generation, Collection & Open Burning Locations-

A) Open Burning Solid Waste/Garbage & Other Waste		
Name of Location	Type of Waste	Tentative Quantity ??????? (??.??)
	i. Solid Waste/Garbage, ii. Horticulture/Garden Waste, iii. Plastic Waste, iv. E Waste, v. Others.	

9.2 Actions to Mitigate Air Pollution -

During the discussion, it is highlighted that Burning of- Solid Waste/Garbage, Garden & Horticulture Waste, Plastic Waste, E-Waste in the form of Wire etc. significantly contribute to the rising Air Pollution in Mumbai City. To control this, it is suggested to undertake below mentioned immediate & long-term actions.

	Actions to be undertaken
Immediate Actions	1) 100% Collection of Solid Waste/Garbage by BMC & transfer to Dumping Site. Special emphasis in Slums Areas etc. where sizeable number of Littering (open dumping) is carried out. 2) Wardwise special inspection drive to identify the Open Burning Spots. 3) Wardwise special cleanliness drive to immediately remove Littered (open dumped) Solid Waste/Garbage, Garden & Horticulture Waste, Plastic Waste, E-Waste etc. 4) Deployment of Nuisance Detectors (N.D.) for taking action & penalising the defaulters (involved in Littering, Dumping & disposal by burning) as per Greater Mumbai Cleanliness and Sanitation Bye-Laws 2006
Long-Term Actions	1) 100 % Collection of Solid Waste/Garbage by BMC & transfer to Dumping Site. 2) Inspection Calendar to regularly check the vulnerable spots for control of Littered (open dumped) & Open Burning of Solid Waste/Garbage, Garden & Horticulture Waste, Plastic Waste, E-Waste etc. 3) Increase in penalty fine of acts under Greater Mumbai Cleanliness and Sanitation Bye-Laws. 4) Public Awareness & Public Outreach Programs to be carried out. 5) Google Mapping of Existing Solid Waste Collection Centres, Dry Waste Segregation Centres, Horticulture Waste Composting facility so that waste will be channelized to facility. 6) 100 % scientific treatment of waste that is generated. 7) 100 % treatment of Legacy Waste to prevent spontaneous fire. 8) Promotion of Reduce, Reuse & Recycling to lower down the waste generation.

9.3 Checklist on Actions-

Based on the above actions, the checklist will be prepared by concerned department/ward.

9.4 Enforcement Mechanism-

- The above actions will be circulated to the Contractors for implementation.
- The concerned contractors shall be responsible to comply with the said actions.

9.5 Monitoring Mechanism-

1) Concerned contractor shall submit self- certification complying on said actions on weekly basis to the Ward Assistant Engineer (SWM).

9.6 Actions for Non-Compliance-

1) On failure of compliance, Warning Letter to be issued to the contractor for rectification/ compliance.

2) Pursuant to the warning letter, if the contractor fails to comply or shows negligence towards adoption & enforcement of actions then further stringent action including penal actions as per contract conditions will be initiated.

10. Control of Air Pollution from Unclean Fuel

10.1. Inventory of Fuel Usage-

The ward wise template will include information on-

Fuel usage by Hotels, Restaurants, Dhabas, Bakeries, & Other Establishments									
	Total Number	Name	Location	Coal or wood charcoal fired Tandoor, Specify	Daily Quantity of Coal or Wood Charcoal used (in Kg.)	Type of Cooking Fuel Used	Daily Quantity of Fuel used (in Kg./Ltr.)	Details of channelization or Control system provided for Emission (Yes/No & Details)	Chimney / Stack Height (in mtr.)
Hotels									
Restaurants									
Banquet									
Halls									
Dhabas									
Bakeries									
Eateries									
Eating Stall on Street									

10.2. Actions to Mitigate Air Pollution -

Hotels, restaurants, etc. use large amount of coal & other fuel mixtures. Coal is one of the largest contributors of PM 10. Other unclean fuel usage in hotels, restaurants, etc. also adds to Air Pollution. To control this, it is suggested to undertake below mentioned immediate actions-

	Actions to be undertaken
Immediate Actions	1) Special Drive to be undertaken to identify the Hotels, Restaurants, Banquet Halls etc. using unclean fuel as well as using coal to fire Tandoor. 2) Immediate directions to be given to convert the existing unclean fuel to cleaner fuel.

10.3. Checklist on Actions-

Based on the above actions, the checklist will be issued to Ward Level Task Force.

10.4. Enforcement Mechanism-

1) The above actions will be circulated to the concerned departments, owners & operators of Hotels, Restaurants, Dhabas, Bakeries, & Other Establishments for implementation.

2) The concerned departments, owners & operators shall be responsible to comply with the said actions.

10.5. Monitoring Mechanism-

Ward Level Task Force in co-ordination with the concerned departments shall visit to Hotels, Restaurants, Dhabas, Bakeries, & Other Establishments to monitor the compliance.

10.6. Actions for Non-Compliance-

1) On failure of compliance, Warning Letter will be issued to the establishments for rectification/ compliance.

2) Pursuant to the warning letter, if the establishments fail to comply or shows negligence towards adoption & enforcement of actions then further stringent action will be initiated.

11. Control of Air Pollutions from Crematoria

11.1 Inventory of Crematoriums -

The template will include ward wise information on-

	Total Cremation Pyre and furance	Number of Wood Pyre Set (Conventional)	Pyre set		Type of Air Pollution Control System (APCS) Provided	Number of Eco-friendly Pyreset	Number of PNG Cremation System (With APC)	Number of Electric Cremation System (With APC)	Chimney/ Stack Height (in Mtr.)
			With APC	Without APC					
Name & Location of Crematorium & details of Cremation Facility									

11.2 Actions to Mitigate Air Pollution -

Massive piles of firewood are burnt in the cremation process. This process generates various pollutants in large number. In Mumbai, these crematoriums are in residential areas & thus, it is essential to control

the emission from Crematoriums. The below actions can be undertaken to control the emission-

	Actions to be undertaken
Immediate Actions	1) As all crematoriums in Mumbai have more than 01 pyre/furnace, the Wood Pyre Cremation not having Air Pollution Control System (APCS) should be avoided for usage (if possible). Instead, wood pyre crematoria having APCS or Electric/PNG based crematoriums shall be preferred. 2) Immediate assessment of all Crematoriums for working & adequacy of Air Pollution Control System (APCS) to be undertaken. If the APCS working found to be inadequate, immediate repairing/refurbishment works to be undertaken. 3) Public Awareness Posters to be placed on entry gate of crematoriums to motivate citizens to use the Eco-friendly pyre/ Electric/PNG based furnace crematoriums instead of wood pyre crematorium.
Long-Term Actions	1) Target based conversion or new installation of PNG based furnace crematoriums. 2) Advanced Control System should be adopted in place of Conventional APC system

Checklist on Actions-

Based on the above actions, the checklist will be prepared by concerned department/ward.

11.4 Enforcement Mechanism-

1) The above actions will be circulated to concerned department & contractor for implementation.

2) The concerned department & contractor of crematoriums shall be responsible to comply with the said actions.

11.5 Monitoring Mechanism-

1) Ward Level Task Force in co-ordination with the concerned department shall visit to the crematoriums to monitor the compliance.

11.6 Actions for Non-Compliance-

1) On failure of compliance, Warning Letter to be issued to the contractor for rectification/ compliance.

2) Pursuant to the warning letter, if the contractor fails to comply or shows negligence towards adoption & enforcement of actions then further stringent action including penal actions as per contract conditions will be initiated.

12. Control of Industrial Air Pollution

12.1 Inventory of Industries -

The template will include ward wise information on-

	Name	Location	Engagement for - Government or Private or Both	Quantity
RMC Batching Plant- Commercial				
RMC Batching Plant- Captive Plant				
Casting Yard Plants				
Hot Mix Plants				

Category of Industry	Scale of Industry	Total Number	Number of Air Polluting Industries/Industries with Emissions	Details of Fuels Used
Red	Large			
	Medium			
	Small			
Orange	Large			
	Medium			
	Small			
Green	Large			
	Medium			
	Small			

12.2 Actions to Mitigate Air Pollution -

Mumbai City has many large-scale industries such as Refineries, Thermal Power Plant, Fertilizer, Storage of Chemicals, Automobile industries etc. Mumbai being a financial capital of India also houses many medium- and small-scale industries. These industrial operations are a significant cause of pollutants. For Control of Air Pollution from Industries actions to be undertaken includes-

	Actions to be undertaken
Immediate Actions	1) Inspection Drive to be carried out by Maharashtra Pollution Control Board (MPCB) at all the RMC Batching Plant- Commercial & Captive, Casting Yard Plants, Hot Mix Asphalt Plant to verify the compliance including the Air Pollution Control Measures as per the Consent Conditions. 2) Issue of Direction Letters to Building & Construction Projects & Infrastructure Projects for compliance of Air Pollution Control Measures as per Environmental Clearance & Consent Conditions. 3) Issue of Direction Letters to all other Air Polluting Industries for compliance of Consent Conditions. 4) Enforcement of Action Plan for Large Industries. 5) Petrochemical Industries to be directed for fence monitoring of VOC's and their emission control. 6) Regular Audit of Stack Emission for QA/QC in Thermal Power Plant. 7) Surprise Visit to Industries for Air Sampling. 8) Actions against unauthorized industrial units.

	Actions to be undertaken
Long-Term Actions	1) Issue of Advisories for promoting cleaner production in Industries. 2) Improved Combustion Technology in Industries.

13.3 Checklist on Actions-

Based on the above actions, the checklist will be issued by Maharashtra Pollution Control Board (MPCB).

12.4 Enforcement Mechanism-

1) The above actions will be circulated to all the Industries by Maharashtra Pollution Control Board (MPCB) for implementation.

2) The concerned industries shall be responsible to comply with the said actions.

12.5 Monitoring Mechanism-

Maharashtra Pollution Control Board (MPCB) to monitor the Environmental Clearance &/or Consent Conditions.

12.6 Actions for Non-Compliance-

On failure of compliance, Maharashtra Pollution Control Board (MPCB) will take legal action as per the provision of Water Act, 1974, Air Act, 1984 & Hazardous & Other Waste (Management and Transboundary Movement) Rules, 2016 and as per the MPCB's Enforcement Policy, 2016.

13. Control of Vehicular Pollution

13.1 Inventory of Vehicles-

The template will include ward wise information on-

a) Total Numbers of Vehicle Registered (RTO-01, 02, 03 & 47) in • FY 2020-21, • FY 2021-22 & • FY 2022-23?						
b) Fuel Wise Details of Vehicles Registered & are on Roads till February 2023-						
Vehicle Type	Fuel- Petrol	Fuel- Diesel	Fuel-LPG	Fuel- CNG	Fuel- Electric	Fuel- Others
2-W						
3-W (Rickshaws)						
3-W (Others)						
4-W						
Taxi (Metered)						

b) Fuel Wise Details of Vehicles Registered & are on Roads till February 2023-						
Vehicle Type	Fuel- Petrol	Fuel- Diesel	Fuel-LPG	Fuel- CNG	Fuel- Electric	Fuel- Others
Taxi (Tourist Cab)						
Buses (Government)						
Buses (Private)						
School Buses						
Ambulances						
Trucks & Lorries						
Tankers						
Delivery Van (4-W)						
Tractors						
Arti. & Multi. Vehicle						
Others						
Total Vehicles per 1000 population						
c) Fuel Wise Details of Vehicles Registered in FY 2021-22						
2-W						
3-W (Rickshaws)						
3-W (Others)						
4-W						
Taxi (Metered)						
Taxi (Tourist Cab)						
Buses (Government)						
Buses (Private)						
School Buses						
Ambulances						
Trucks & Lorries						
Tankers						
Delivery Van (4-W)						
Tractors						
Arti. & Multi. Vehicle						
Others						
Total Vehicles per 1000 population						

d) Fuel Wise Details of Vehicles Registered in FY 2022-23						
Vehicle Type	Fuel- Petrol	Fuel- Diesel	Fuel-LPG	Fuel- CNG	Fuel- Electric	Fuel- Others
2-W						
3-W (Rickshaws)						
3-W (Others)						
4-W						
Taxi (Metered)						
Taxi (Tourist Cab)						
Buses (Government)						
Buses (Private)						
School Buses						
Ambulances						
Trucks & Lorries						
Tankers						
Delivery Van (4-W)						
Tractors						
Arti. & Multi. Vehicle						
Others						
Total Vehicles per 1000 population						
e) Number of PUC Centres in Mumbai City?						
f) Number & Location of Pay & Park Facility including Number of Vehicles that can be parked?						
g) Number of Vehicles scrapped in FY 2022-23?						
h) Number of existing private cars plying on roads that are older than 20 years?						
i) Number of existing commercial vehicles plying on roads that are older than 15 years?						
j) Number of Abandoned Vehicles removed in FY 2022-23?						
k) Tentative Number of Abandoned Vehicles currently parked on Roads?						

13.2 Actions to Mitigate Air Pollution -

The rapid urbanization has resulted in a tremendous increase in the number of motor vehicles. As the number of vehicles continues to grow and the consequent congestion increases, vehicles are now becoming the main source of air pollution in urban India. For Control of Air Pollution from Vehicles actions to be undertaken includes-

	Actions to be undertaken
Immediate Actions	1) Deployment of additional staff on roads for checking of vehicles and vehicular traffic movement management. 2) Launch extensive drive against polluting vehicles to ensure Strict actions against visibly polluting vehicles. 3) Strict actions for parking of vehicles at non-designated parking areas. 4) Regular checking of Vehicular Emission & Issue of Pollution under Control Certificate. Priority will be given to Vehicles carrying Construction & Demolition Material, Heavy Vehicles, Taxis & Rickshaws. 5) Use of off-peak passenger travel time to move freight & Restriction of entry of heavy vehicles into cities during day time 6) Check overloading of trucks, lorries & vehicles carrying Construction & Demolition Material. 7) Covering of Vehicles to be made mandatory for all type of vehicles carrying all type of Construction & Demolition Material. 8) Removal of Abandoned Vehicles (Khatara Hatav Campaign) for decongestion of road traffic.
Long-Term Actions	1) Phasing out older vehicles as per vehicle scrappage policy. 2) Traffic Decongestion Plan to be notified comprising Traffic Congestion Points & Decongestion Strategy.

13.3 Checklist on Actions-

Based on the above actions, the checklist will be issued by Regional Transport Office (RTO) & Mumbai Traffic Police (MTP).

13.4 Enforcement Mechanism-

1) The above actions will be given large scale publicity & advertisement.
2) These actions will be circulated to stakeholders by Regional Transport Office (RTO) & Mumbai Traffic Police (MTP) for implementation.

13.5 Monitoring Mechanism-

Regional Transport Office (RTO) & Mumbai Traffic Police (MTP) shall carry out special drive by deploying additional staff to inspect the vehicles & monitor actions.

13.6 Actions for Non-Compliance-

On failure of compliance, Regional Transport Office (RTO) & Mumbai Traffic Police (MTP) will take action as per the provision of Motor Vehicles Act.

14. Other Actions to Mitigate Air Pollution

14.1 Greening & Plantation-

	Actions to be undertaken
Immediate Actions	1) Daily Watering to all the Plants, Trees, Plantation on Open Spaces, Traffic Corridors, Gardens. 2) Daily Water Sprinkling on Recreational Grounds, Play Grounds & Open Spaces. 3) Greening & Landscaping of all Major & Arterial Roads. Focus to be on stretches with high Dust & high vehicular movement. 4) Extensive Tree Plantation focusing Traffic Corridor, Open Area etc. 5) While filling of earth material &/or watering plants on traffic- divider, median & intersection, care must be taken to avoid soil spillage. 6) Complete Ban on storing loose garden soil on Public Roads, Footpaths, Pavements & Open Area.
Immediate & Long-Term Actions	1) Installation of Water Fountains at traffic intersection & chowks.

15. Capacity Building & Public Outreach Program

For effective implementation of air pollution mitigation plan, Sector specific Workshops on Capacity-Building programmes for all the concerned departments & stakeholders will be undertaken.

As per the guidelines of Ministry of Environment, Forest & Climate Change (MoEF&CC), Annual Program for 'Capacity Building and Outreach Programmes' will be prepared & activities will be undertaken.

In October 2022, Mission LiFE (Lifestyle for Environment) was launched to sensitise and educate the masses on LiFE actions which can promote sustainable living and help tackle climate change. It includes list of 75 individual LiFE actions across 7 categories to practice simple environment-friendly actions (LiFE actions) in their daily lives. Under Mission LiFE, Awareness Programs will be organised.

16. Environment & Lung Health Institute-

Haze forms when weather conditions remain stagnant for a considerable length of time which leads to lingering of dust, smoke and other pollutants along the vertical profile of the city. In some cases, specific weather patterns can cause haze to form in areas somewhat far away from the origination point of the dust, smoke or pollutant particles. Though haze contains dust and smoke particles, however, in dense urban regions it also contains air pollutants such as sulphur dioxide, nitrogen dioxide, ground level ozone, organic aerosols, carbon monoxide and particulate matter. The fine particles that make up haze can go deep into the lungs, and in some cases, enter the bloodstream. Major health risk is posed by the PM2.5 which in haze conditions is not purely dust particles but secondary reacted particulate matters. This can penetrate right into the small air sacs in human lungs when inhaled. Its presence can aggravate lung disease, causing asthma attacks, acute bronchitis as also increase susceptibility to respiratory infections. Short- term exposures can lead to in people with heart disease and arrhythmias whereas Long- term will result in reduced lung function and the development of chronic bronchitis including premature mortality.

Looking at the overall changing landscape of air pollution, environmental factors & climate change, major contributing factors for disease burden in city and similarly in many cities of Maharashtra, there is a need to consider an action plan. In near future, there is a possibility of increasing disease burden which need preventive and curative steps. Brihanmumbai Municipal Corporation (BMC) had established Environmental Pollution Research Centre (EPRC) at KEM Hospital few decades back, which worked towards understanding air pollution and health impacts. It is imperative that an Institute is created which will address the whole gamut of issues of health arising from Air Pollution, Environment & Climate Change.

17. Task Force

17.1 BMC's Ward Level Task Force

Ward Level '03' Task Force will be constituted comprising of below mentioned officers for implementation of Air Pollution Mitigation Action Plan.

Ward Level 01st Task Force will include	Ward Level 2nd Task Force will include	Ward Level 3rd Task Force will include
Assistant Engineer (B&F)	Assistant Engineer (SWM)	Assistant Engineer (Division M&E)
Assistant Engineer (B.P.)	Sub-Engineer (Maintenance)	Medical Officer of Health (MoH)
Sub-Engineer (R.E.)	Horticulture Assistant (Ward)	Sub-Engineer (Ward M&E)
*Oversee Chapter No. 5, 6, 7, 8.1	*Oversee Chapter No. 8.2, 9, 14.1	*Oversee Chapter No. 10, 11

Objective of Ward Level Task Force-

1) The Task Force will visit the Projects, Sites to inspect the compliance as per guidelines/actions within a week.

2) The Task Force will issue Warning Letter on 1st non-compliance.

3) The Task Force will again visit & inspect about the compliance mentioned in the Warning Letter.

4) If non-compliance is again reported, Task Force will take penal action for 2nd non- compliance with the approval of the concerned Executive Engineer/MoH.

5) The Task Force will submit weekly action taken report to the concerned Assistant Commissioner.

17.2 Works by other Agencies & Departments-

BMC's Ward Level Task Force mentioned in above para 17.1 shall be empowered to visit & inspect Construction/Projects by other agencies/departments such as MHADA, MIDC, MMRDA, MPT, MSRDC,

SRA, AAI, MMB & PWD, Railways, Maharashtra Forest Department etc. & take necessary actions as mentioned in above para 17.1.

18. Institutional Mechanism-

Brihanmumbai Municipal Corporation (BMC) is in process to form 'Climate Action Cell'. This cell will comprise of technical subject experts which will be posted at Ward Level & Head Office to co-ordinate & assist with various BMC's department for implementation of Actions for improvement of Air Quality under Mumbai City Air Action Plan and to execute the Mumbai Climate Action Plan (MCAP) for climate resilience & achievement of Net Zero Target.

BMC has also made Budgetary provisions in the Budget Estimates of 2023-24 for control of Air Pollution.

19. Review

The enforcement & implementation of Guidelines & Actions will be reviewed by respective Assistant Commissioner on weekly basis.

Assistant Commissioner shall submit report in prescribed format to the Additional Municipal Commissioner (WS) on 5th & 20th Date of Every Month. If holiday falls on same date, the report shall be submitted on next working day.

20. Corrective Measures

Inventory Data & Action Taken Report (ATR) will be submitted on monthly basis for progress review and further corrective measures to-

- City Level Air Quality Monitoring Committee &
- Technical Advisory Committee.

Refernces :

1) Solid Waste Management Rules, 2016.

2) C&D Waste Management Rules, 2016.

3) Central Pollution Control Board (CPCB).

Circular on harmonization of classification of industrial sectors.

4) Maharashtra Pollution Control Board (MPCB).

Guidelines for citing criteria of Ready-Mix Concrete (RMC) plant, 2016.

5) Central Pollution Control Board (CPCB).

Guidelines on Environmental Management of C & D Wastes, March 2017.

6) Central Pollution Control Board (CPCB).

Guidelines on Dust Mitigation Measures, November 2017.

7) Hon. Supreme Court Order vide SLP (Civil) No. D23708/2017 dtd. 15.03.2018.

8) Central Pollution Control Board (CPCB), Maharashtra Pollution Control Board (MPCB).

Revised Action Plan for Control of Air Pollution in Non-Attainment Cities of Maharashtra- Mumbai City Action Plan, 2019.

9) Central Pollution Control Board (MPCB), Maharashtra Pollution Control Board (MPCB).

Graded Response Action Plan.

27. GUIDELINES FOR AIR POLLUTION MITIGATION IN MUMBAI

For control of Air Pollution level, the guidelines had been issued on 25.10.2023 by the Municipal Corporation of Brihanmumbai due to large increase in construction, demolition and similar activities in the city. These guidelines are mandatory for all related stakeholders and must be followed strictly. Otherwise strict action can be taken by the Municipal Corporation.

The guidelines are as follows ;

(l) All the project proponents to ensure that at least 35 feet high tin / metal sheets shall be erected around the periphery of construction projects having height more than 70 mtr.

(2) All construction layouts having area more than l(one) acre shall have tin / metal sheet erected of height 35 feet at least around periphery of the construction project sites and for construction sites, less than 1 (one) acre, the tin / metal sheet height shall be 25 feet at least.

(3) All the buildings under construction shall be compulsorily enclosed by green cloth /jute sheet / tarpaulin from all sides.

(4) All the structures under demolition shall be covered with tarpaulin / green cloth / jute sheet from top to bottom. There shall be continuous sprinkling / spraying of water during the process of demolishing of the structure.

(5) It shall be ensured that water fogging shall be carried out during loading and unloading of materials at the construction sites (use of stationary/ mobile anti- smog guns).

(6) The water sprinkling shall be done on debris I earth material etc. which are prone to generate air borne particulate matters at all construction sites without fail.

(7) All vehicles carrying construction materials shall be fully covered (i.e. from top and all sides) so that construction material or debris does not become airborne during transportation and the vehicle shall not be overloaded to avoid any spillage from the vehicle.

(8) All construction sites shall install CCTV cameras along the periphery of their work sites to ensure that vehicles are plying after cleaning tyres and are not overloaded .

(9) All construction sites to deploy sensor based air pollution monitors at work sites and act immediately on observing pollution levels exceeding the limit. This monitoring shall be made available for inspection to BMC authorities as and when demanded.

(10) All the work sites shalr ensure that the grinding, cutting, drilling, sawing and trimming work is carried out in enclosed arca andwater sprinklgr / water fogging is continuously done while working to avoid escape of fugitive air.

(ll) All the construction sites shall ensure that c & D (Construction and Demolition) waste generated within the premises / site of work is transported to designated unloading site strictly as per BMC,s c &, D waste Management plan. After unloading the debris, the vehicle shall be washed and cleaned thoroughly.

(12) All vehicles carrying materials shall have valid pUC certificates and the same shall be produced as and when asked for by competent authorities.

(13) AII the construction personnel / managers shall mandatorily wear personal protective equipment such as masks, goggles, helmets, etc.

(14) All the BMC worksites like bridges and flyovers shall have barricading of 25 feets.

(15) All the metro works above ground shall be covered with barricading of 25 feet height. The construction site shall be covered with tarpaulin / green cloth / jute sheet' The smog guns / water sprinklers shall be used during the construction work.

(16) The mitigation measures suggested as above shall be mandatorily observed by other agencies like sRA, MHADA, MIDC, MSRDC, MMRDA, Bpr, Airport Authority of India, Railways, Govt. or Semi Govt. authorities and private construction sites.

(17) All Asstt. Commissioners in charge of Wards shall arrange to deploy special squads to prevent illegal C & D dumping at late night.

(18) AII Asstt. Commissioners in charge of Wards shall deploy squads for air pollution mitigation enforcement comprising of :-

i) Two (Ward) engineers

ii) One Policeman

iii) One marshall

iv) Vehicle

Each squad shall be headed by one senior officer from the ward.

The formation and deployment of these squads at Ward level shall be done immediately.

The number of squads Ward-wise shall be as follows :_

a) Smaller wards - 2 squads each ward

b) Middle size wards - 4 squads each ward

c) Larger size wards - 6 squads each ward.

(19) The enforcement squad shall visit the premises and videograph the worksite. If it is observed that the worksite is not adhering to above stated provisions, stringent action such as issue of Stop Work notice and,lor sealing of worksite shall be taken immediately.

(20) The timeline for procurement of sprinklers shall be 15 days and for procurement of smog guns shall be 30 days from issuance of this circular. All the project proponent / contractors shall abide by the above timelines without fail.

(21) The vehicles carrying construction material or C & D material, if found not adhering to above stated provisions, shall be seized and impounded.

(22) The Transport Commissioner shall take action against overloading of vehicle, uncovered vehicles, vehicles spilling construction materials on roads and the heavy duty diesel vehicles which are more than 8 years old shall be strictly prohibited in Mumbai jurisdiction.

(23) MPCB shall monitor the air pollution emitted from the industries such as BpCL, HPCL, RCF, Tata Power, industries in nearby MIDC arca etc. daily for next one month and take appropriate action. The daily monitoring data shall be shared with AMC (City) and A.M.C.(W.S.).

(24) All builders / Developers shall engage only those vehicles whioh possess vehicles tracking system installed on them'

(25) The loose soil, sand, construction materials and debris of any kind and quantity shall be stored in demarcated / dedicated area and properly barricaded, fully covered / enclosed / protected with tarpaulins. It shall be ensured that there is no dumping of construction material and debris on public roads, footpaths' pavements and oPen area.

(26) Vehicle tyre washing facility shall be provided at all exit points of construction sites. It shall be ensured that daily cleaning is carried out of major roads for removal of dust by using vacuum sweeping or water sprinkling, brushing' brooming and sweeping. This work may be outsourced to ensure wide and fast coverage of all major roads in one month's time'

(27) There shall be complete ban on open burning anywhere in the geographical are a under BMC, especially

SALIENT FEATURES OF ENVIRONMENT STATUS REPORT

1. Establishment of a special department 'Mumbai Mangroves Conservation Unit' in view of the increasing environmental pollution threats such as encroachment, pollution, urbanization, industrialization and solid waste pollution on mangroves in Mumbai area.

2. In the year 2022-2023, 6214 trees were planted by traditional method and 69975 trees were planted by Miyawaki method in the open spaces available along the roads and under the jurisdiction of the Municipal Corporation. Till date, more than 4 lakh trees have been planted by Miyawaki method.

3. Posters, local newspaper advertisements, banners by Rain Water Harvesting Cell of Brihanmumbai Municipal Corporation to create water saving and water conservation structures under the Central Government's nationwide campaign 'Jalshakti Abhiyan : Catch the Rain 2022 – Whenever and where it falls'., street dramas etc. campaign has been undertaken.

4. To bring the increasing air pollution in Mumbai city under immediate control, 'Mumbai Air Pollution Mitigation Plan - 2023' has been prepared and the plan is being implemented from 1st April 2023.

5. The average amount of waste collected in the year 2022 has been 6300 MT per day due to various activities implemented by Brihanmumbai Municipal Corporation in the last 5 years. That's 6300 Ton's may be generated per day. Tons of solid waste disposal is done by 921 vehicles per day and the generated waste is segregated according to category and quantity and transported separately.

6. 'Swachh Bharat Abhiyan 2.0' - Waste segregation at household level, Scientific treatment of old accumulated waste, Construction of sky toilets, 100% sewage management - Collection - Transportation - Process etc. matters are being addressed through the Solid Waste Department.

7. Mumbai Coastal Road (South) Project – The project will speed up travel time, save fuel and reduce traffic congestion in Mumbai and its suburbs.

8. For the academic year 2022-23, a campaign 'Mission Admission' was implemented by the Department of Education, Brihanmumbai Municipal Corporation under the initiative 'Ekach Lakshya – Ek Laksha'. Through this campaign, the Municipal Corporation succeeded in bringing a large number of matriculated and out-of-school students into the stream of education.

9. Establishment of Continuous Ambient Air Quality Survey Centers at various 5 locations within Brihanmumbai Municipal Corporation during the year 2022-23 through Environment Department. Air quality status, Air Quality Index (AQI) etc. through these centers. Information available through Digital Display Board.

10. Education on health effects of air pollution and remedial measures is provided to asthma patients through 'Health Education Initiative' through Environmental Pollution and Research Center (KEM Hospital).

11. Quick and effective response to citizens in emergency situations, coordination among all systems, availability of information at speed, promoting at all levels, immediate assistance to disaster victims, always alert information etc. services available through the Department of Disaster Management.

12. As per the Energy Saving Policy of Government of India, replacement of existing HPSV / MH lamps in the city of Mumbai with energy efficient LED lamps resulted in a total energy saving of 47% in various departments of the Brihanmumbai Municipal Corporation.

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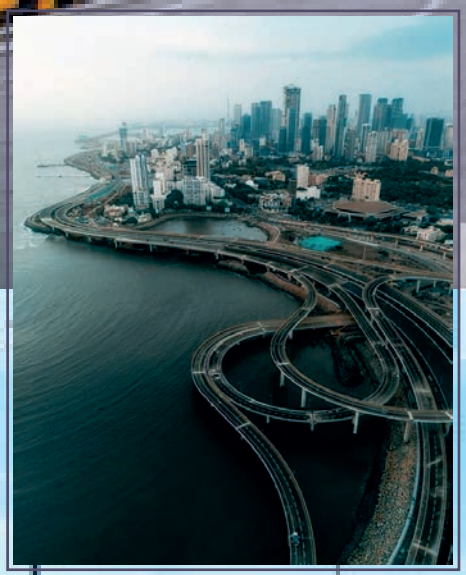
Air Purifier unit on BEST bus

Dust Suppression Vehicle

ev-BEST bus - Best solution in Air Pollution Control



Dharamveer, Swarajya Rakshak Chhatrapati Sambhaji Maharaj Mumbai Costal Road